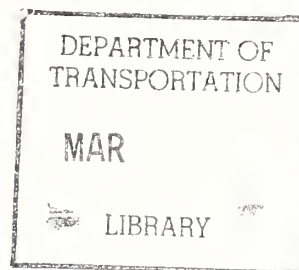




U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**



DOT HS 807 002  
Test Report

June 1985

## **Side Impact Protection in Production Vehicles**

MDB-to-Car Side Impact Test of a  
26° Crabbed Moving Deformable Barrier  
to a 1982 Nissan Sentra at 33.4 mph

The United States Government does not endorse products or manufacturers. Trade or manufacturers' names appear only because they are considered essential to the object of this report.

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TRANSPORTATION

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Technical Report Documentation Page

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15. Supplementary Notes This test conducted as part of VRTC Project No. SRL 103 Side Impact Protection In Production Vehicles					
16. Abstract  This test report documents one of a series of ten crash tests to evaluate side impact protection in various vehicle models. Testing was conducted on a 1982 Nissan Sentra 2-door Sedan at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbed to 26°, at 33.4 mph. The test was a simulation of a 90° intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear seating position. The test date was April 30, 1985 and the ambient temperature was 72°F.					
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SECTION 1.0  
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate side impact protection in one of a fleet of 2-door and 4-door vehicles. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1982 Nissan Sentra 2-door sedan was impacted on the left side by a Moving Deformable Barrier (MDB) on April 30, 1985. The test was to simulate an intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Nissan Sentra at 33.5 mph with the MDB's wheels crabbed clockwise to 26°. The actual test speed was 33.4 mph and the actual leading edge of contact was 37.0 inches forward of the midpoint of the Nissan Sentra's wheelbase.

The vehicle was a baseline model with no structural modification. The driver door and left rear door were unpadded.

Section 2 contains General Test and Vehicle Parameter Data. Section 3 contains data required by R & D. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Data Plots. Appendix C contains Dummy Certification Data.



SECTION 2.0  
GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Nissan Motor Company

MAKE/MODEL: Nissan Sentra

VIN: JN1HB125XCU033878

BODY STYLE: 2-Door Sedan

MODEL YEAR: 1982

NHTSA NO.: R & D

COLOR: Silver

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT 90.8 CID

TRANSMISSION DATA: 5 Speed Manual

DATE VEHICLE RECEIVED: 4/23/85

ODOMETER READING: 47252

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	AIR CONDITIONING	No
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	Yes
OTHER			

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? Yes\*
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Nissan Motor Company

DATE OF MANUFACTURE: 7/82

GVWR: 2875 LBS.,

GAWR: FRONT 1420 LBS., REAR 1465 LBS.

\*Minor dents on left rear and left front fenders and trunk lid.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 24 psi; REAR 26 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Continental 155 SR 13

BIAS PLY, BELTED, OR RADIAL: Steel Belted Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? DNA

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	590	LBS.	RIGHT REAR	392	LBS.
LEFT FRONT	588	LBS.	LEFT REAR	373	LBS.
TOTAL FRONT WEIGHT	1178		LBS. (60.6 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	765		LBS. (39.4 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1943		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 25 1/2	;LF 25 3/4	;RR 24 1/4	;LR 24
PRE-TEST ATTITUDE:	RF 25 5/16	;LF 25 5/16	;RR 22 11/16	;LR 22 1/2
POST-TEST ATTITUDE:	RF 23 1/4	;LF 22 1/4	;RR 20 3/8	;LR 21

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 86 LBS. CARGO:

RIGHT FRONT	610	LBS.	RIGHT REAR	569	LBS.
LEFT FRONT	639	LBS.	LEFT REAR	559	LBS.
TOTAL FRONT WEIGHT	1249		LBS. (52.5 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1128		LBS. (47.5 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2377		LBS.		

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT 2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY\*: NA GALLONS ACTUAL

TEST VOLUME: 2.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): NA GALLONS

DETAILS OF FUEL SYSTEM: DNA

---

---

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: No

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? Yes

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 24 psi; REAR 24 psi

RECOMMENDED TIRE SIZE: 155 SR 13 LOAD RANGE X B,    C,   

VEHICLE CAPACITY: TYPES OF SEATS: Front - Bucket  
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT  
3 REAR  
5 TOTAL

CARGO LOAD 75 LBS.

TOTAL 825 LBS.

\*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

### TEST CONDITIONS

TEST NUMBER: 850430

DATE OF TEST: April 30, 1985

TIME OF TEST: 12:09

WIND VELOCITY: 0-3 mph 130° ESE

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 72° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 78° F

### SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2377	2366
MDB TEST WEIGHT (LBS.)	2983	3000
MDB VELOCITY (MPH)*	33.4	33.5
IMPACT POINT (INCHES)**	37.0	37

### DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:	SID			SID	
SERIAL NO.:	123			U02	
INSTRUMENTATION:					
HEAD ACCEL.:	Yes			Yes	
CHEST ACCEL.:	Yes (Upper/Lower)			Yes (Upper/Lower)	
FEMUR L.C.'S:	No			No	
OTHER:	Pelvis/Ribs			Pelvis/Ribs	

RESTRAINT SYSTEM: Both dummies were unrestrained

\* As measured over final one foot of travel.

\*\* As measured forward of the midpoint of the test vehicle's wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 123	PASSENGER U02
Head	<u>Moving Barrier Face</u> <u>Side Window Sill, Roof</u>	<u>Left C-Pillar, Backlight</u>
Chest	<u>Driver's Door Panel</u>	<u>Left Rear Side Wall</u>
Abdomen	<u>Driver's Door Panel</u>	<u>Left Rear Side Wall</u>
Left Knee	<u>Driver's Door Panel</u>	<u>Left Rear Side Wall</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>NA*</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>No</u>	<u>No</u>
Rear	<u>No</u>	<u>No</u>

GLAZING DAMAGE:

Left side of windshield cracked; all left side windows  
shattered; no backlight damage.

\_\_\_\_\_

\_\_\_\_\_

OTHER NOTABLE IMPACT EFFECTS:

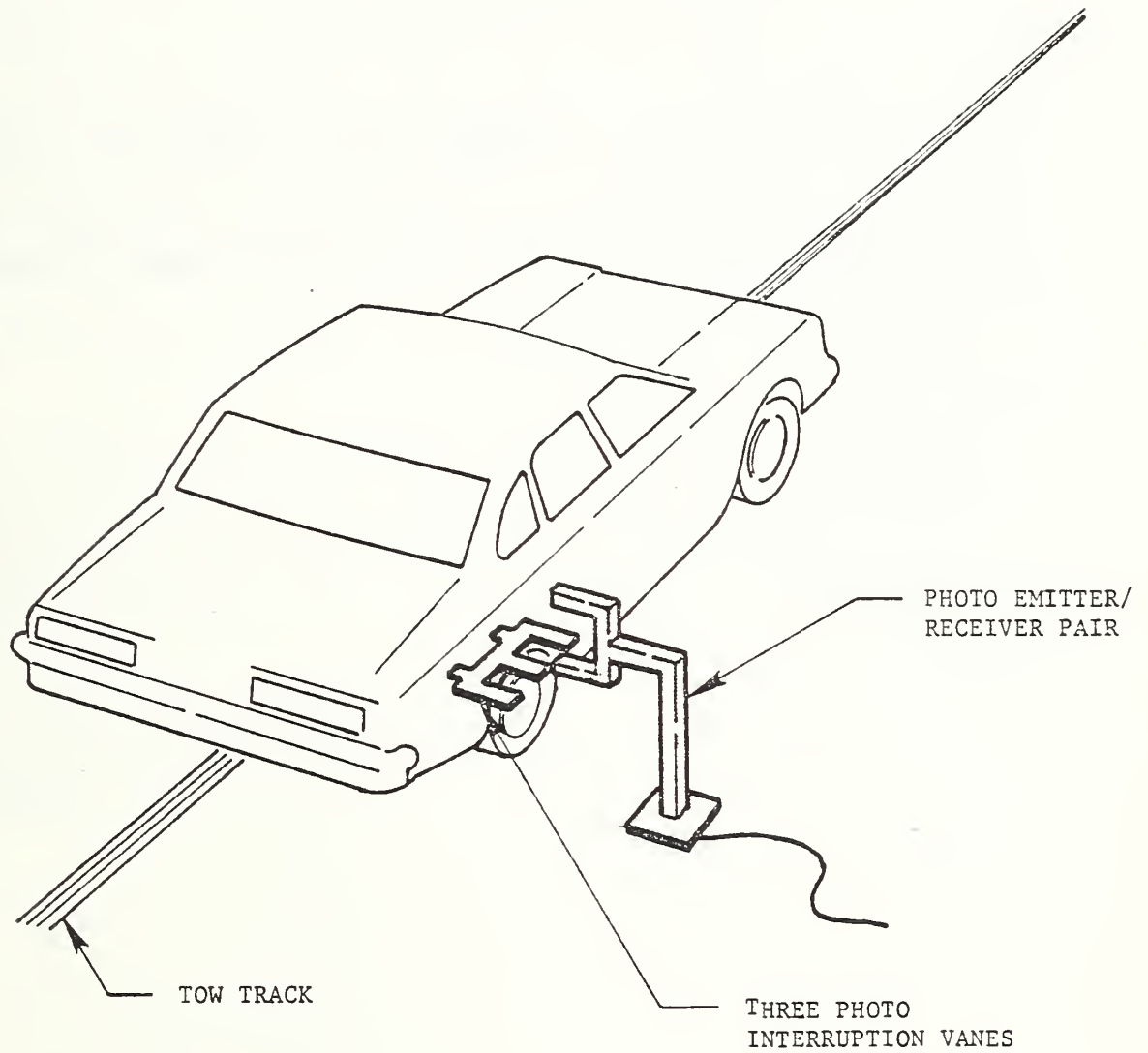
Left side instrument panel separated. Driver dummy  
came to rest with buttocks sitting on front passenger  
side window sill.

\_\_\_\_\_

\_\_\_\_\_

\*CTM to open left side doors at a later date.

# IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver two inches before impact.

The vanes have one foot spacing.

#### VEHICLE TEST WEIGHT CALCULATION

Test Weight = Unloaded Delivered Weight +  
                    Number of Dummies X 174 lbs. +  
                    Cargo Weight  
                    = 1943 + 2 X 174 + 75 lbs.  
                    = 2366 lbs.

To achieve test weight, the exhaust system, battery, rear bumper, alternator, radiator and overflow tank, distributor and master cylinder were removed and 2.0 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a KJ Law Force Plate.

## TEST ANOMALIES

Cable separation occurred in the following dummy data channels:

T12YG1 - Driver Lower Spine Acceleration Y axis

LURYGA - Driver Left Upper Rib Acceleration Y axis

No peak levels, resultants or delta velocities are reported. No resultant or delta velocity plots are included.

Cable separation occurred in the following vehicle data channels:

LFDYG3 - Vehicle Left Front Door (Position 9) Acceleration Y axis

VCGV - Vehicle Yaw Rate

No delta velocity plot for LFDYG3 is included.

Data channel LFSYG - Vehicle Left Front Sill Acceleration Y axis failed prior to test. No data was acquired from this channel and no plot is included in this test report. No delta velocity was calculated. This particular accelerometer failed in a previous test and will be removed from service.

High speed camera number 6 (Ground Level - Left) failed to operate. The failure was traced to wearing in the take-up clutch and has since been repaired.



SECTION 3.0  
DATA REQUIRED BY R&D

The following pages are included in this section:

1. Dummy temperature control and positioning data
2. Dummy kinematic summary
3. Vehicle crush data
4. Dummy and vehicle accelerometer location and data summary
5. High speed camera information
6. Transducer information

#### DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained portably until approximately 1 minute prior to the test.

The following table summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

## DUMMY PLACEMENT AND POSITIONING

### SIDE IMPACT DUMMY

#### DRIVER DSP

#### REAR PASSENGER DSP

HEAD Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.

UPPER TORSO Placed against seat back. Midsagittal plane is vertical and centered on bucket seat.

LOWER TORSO Midsagittal plane is vertical and centered on bucket seat.

UPPER LEGS (thighs or femurs) Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.

KNEES Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.

LOWER LEGS Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.

RIGHT FOOT Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.

LEFT FOOT Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.

Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.

Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.

Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.

Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

\*NOTE: THE SIDE IMPACT DUMMY DOES NOT INCLUDE ARMS.

# DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Nissan Sentra

FRONT SEAT TYPE: BENCH  
X BUCKET  
   SPLIT BENCH

ADJUSTER TYPE: X MANUAL  
   POWER

BUCKET SEAT BACK TYPE: X FIXED  
   ADJUSTABLE

## TECHNICIANS:

1. B. Fishbaugh

2. R. Benavides

3. D. Carpenter

POSITIONING DATE: April 30, 1985

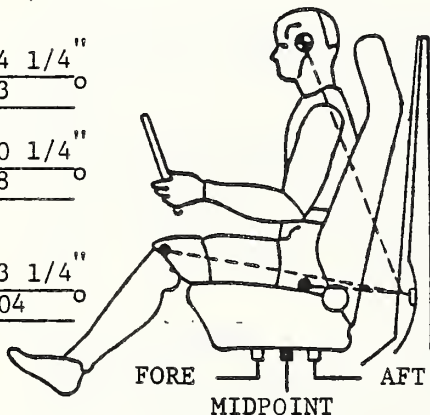
AMBIENT TEMP.: 72° F. TIME: 8:00

DRIVER DUMMY # 123

HEAD 24 1/4"  
 TARGET\* 23°

KNEE 30 1/4"  
 JOINT 88°

APPROX.  
 "H" 13 1/4"  
 POINT 104°

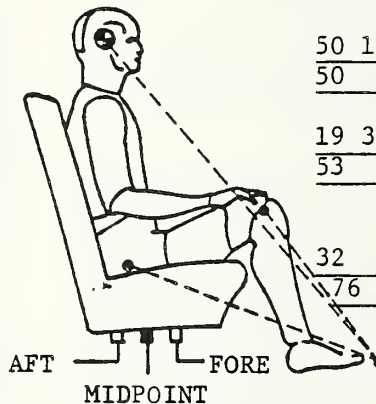


REAR PASSENGER DUMMY # U02

50 1/4" HEAD  
50° TARGET\*\*

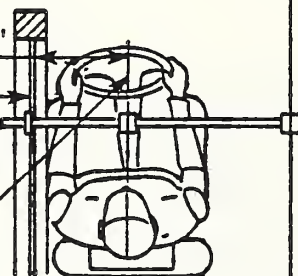
19 3/8" KNEE  
53° JOINT

APPROX.  
 "H" 32"  
 POINT 76°



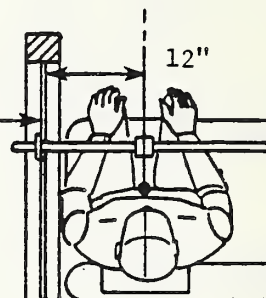
DOOR  
 GLASS  
 HEIGHT\*\*\* 12 3/16"  
9 3/4"

LATERAL BAR  
 ADJUSTABLE  
 POINTER



DRIVER  
 DUMMY #  
 123

DOOR  
 GLASS  
 HEIGHT FIXED

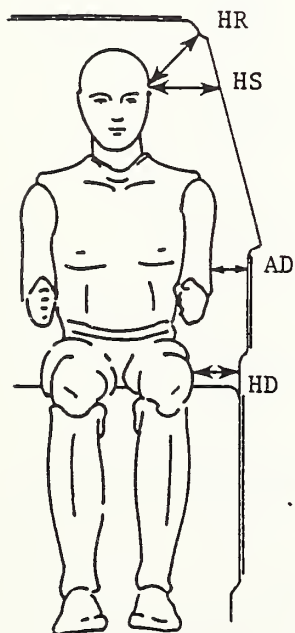
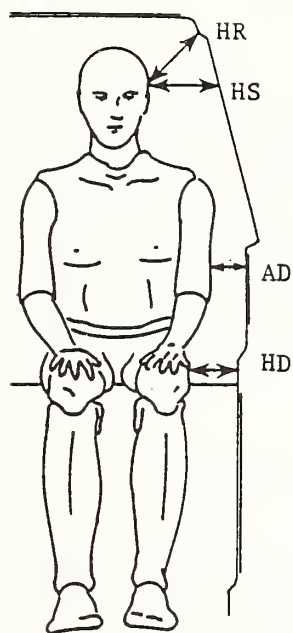


PASSENGER  
 DUMMY #  
 U02

\*All driver dummy dimensions referenced to top of striker bolt and all angles referenced to vertical.

\*\*All passenger dummy dimensions referenced to front seat back latch bolt with front seat in mid-position and all angles referenced to vertical.

\*\*\*Door glass height is equal on the right and left side of vehicle at dummy nose level.



DRIVER

PASSENGER

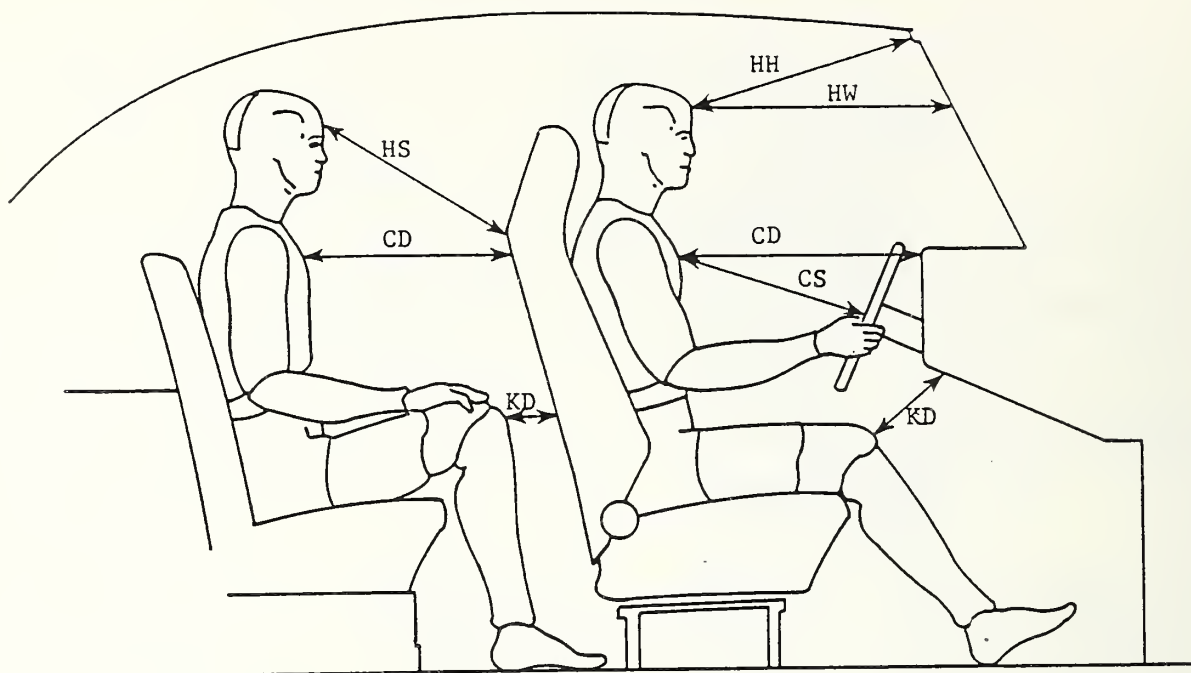
123

U02

	DRIVER 123	PASSENGER U02
HR	7	7 1/16
HS	8 7/8	8 15/16
AD	3 13/16	3 5/8
HD	6 5/8	6

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



DRIVER

PASSENGER

123

U02

HH	19 5/8	DNA
HW	18 1/16	DNA
HS	DNA	25 3/4
CD	19 5/8	19 5/8
CS	11 3/4	DNA
KDL	5 5/8	4 7/8
KDR	5 7/16	5 1/4

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

## DUMMY KINEMATIC SUMMARY

### DRIVER

During impact, the dummy's torso contacted the driver's door and the head contacted the moving deformable barrier top and the side window sill. The dummy rebounded laterally across the front occupant compartment. The buttocks passed through the right front side window as the rear of the dummy's head struck the roof. The dummy came to rest seated on the right front side window sill with its head lodged between the front seat head restraints.

### PASSENGER

During impact, the dummy's torso contacted the left rear side wall and the head contacted the left C-pillar and the backlight. The dummy rebounded laterally across the rear occupant compartment and fell over onto its right side. The head struck the right rear side wall. The dummy came to rest laying across the rear seat on its right side.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH  
ZERO DISTANCE AT PROJECTED IMPACT POINT\*

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	10.8	X	X	18.5	18.5	18.4	18.4	18.4	18.4	18.5	18.4	18.8	18.8	18.9	X	X
H-Point	20.0	X	X	16.6	16.5	16.5	16.4	16.4	16.4	16.4	16.4	16.4	16.5	16.5	16.3	X
Mid Door	23.5	X	16.8	16.6	16.5	16.4	16.4	16.3	16.3	16.3	16.4	16.4	16.4	16.5	16.5	X
Window Sill	35.0	19.8	19.6	19.3	19.3	19.3	19.3	19.1	19.0	18.9	18.8	18.6	18.8	18.8	18.8	18.8
Window Top	52.3	X	X	X	X	X	X	27.5	27.4	27.4	27.5	27.5	27.8	27.1	28.3	X

POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE\*\*)

Axle Height	10.8	X	X	30.9	30.8	30.5	30.6	30.6	30.6	30.9	30.8	29.9	27.3	24.4	X	X
H-Point	20.0	X	X	31.6	34.4	34.6	34.8	34.8	35.0	35.0	34.8	34.5	33.5	31.1	27.6	X
Mid Door	23.5	X	26.0	30.3	31.8	32.2	32.3	32.9	33.6	33.5	33.8	34.1	34.1	32.4	27.8	X
Window Sill	35.0	22.5	23.0	25.1	28.8	30.8	30.5	30.1	30.0	30.3	31.0	32.0	33.3	31.9	28.1	24.5
Window Top	52.3	X	X	X	X	X	X	30.8	30.8	30.9	31.0	31.0	30.5	30.3	30.0	X

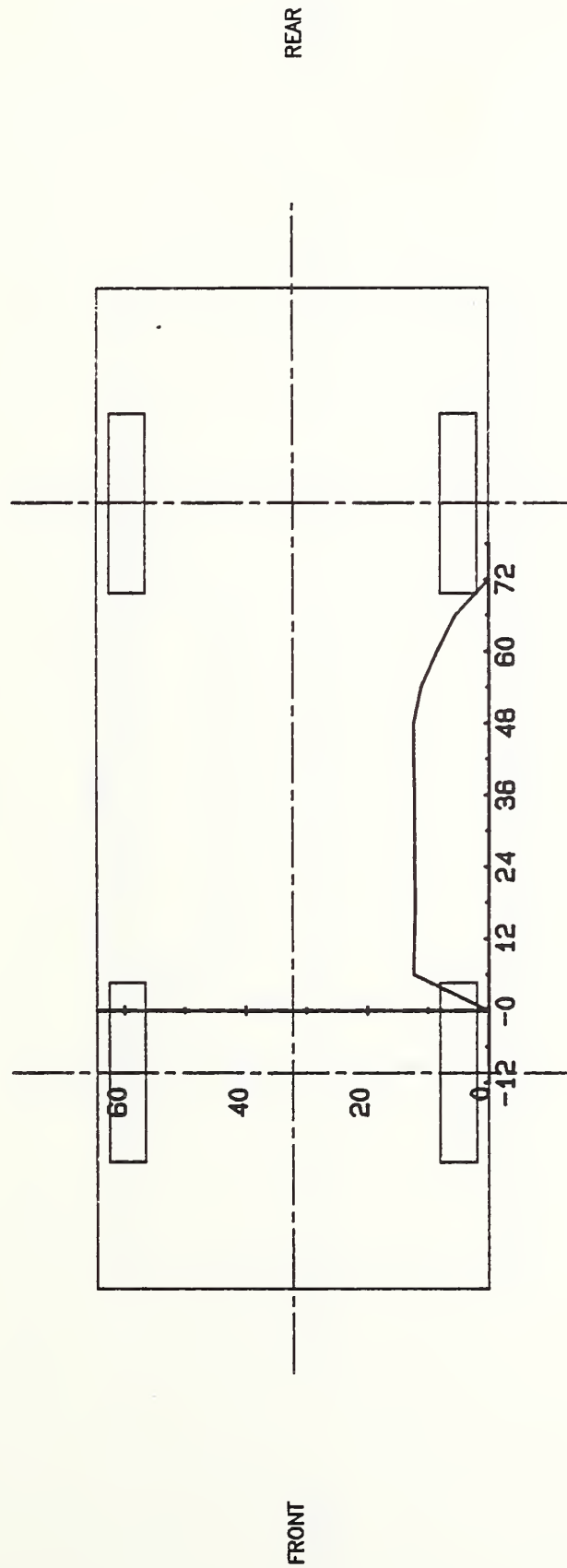
STATIC CRUSH (IN)

Axle Height	10.8	X	X	12.4	12.3	12.1	12.2	12.2	12.2	12.4	12.4	11.1	8.5	5.5	X	X
H-Point	20.0	X	X	15.0	17.9	18.1	18.4	18.4	18.6	18.6	18.4	18.1	17.0	14.6	11.3	X
Mid Door	23.5	X	9.2	13.7	15.3	15.8	15.9	16.6	17.3	17.2	17.4	17.7	17.7	15.9	11.3	X
Window Sill	35.0	2.7	3.4	5.8	9.5	11.5	11.2	11.0	11.0	11.4	12.2	13.4	14.5	13.1	9.3	5.7
Window Top	52.3	X	X	X	X	X	X	3.3	3.4	3.5	3.5	3.5	2.7	3.2	1.7	X

\* Projected impact point is 37 inches forward of driver's side wheelbase midpoint. Column readings are front to rear from left to right.

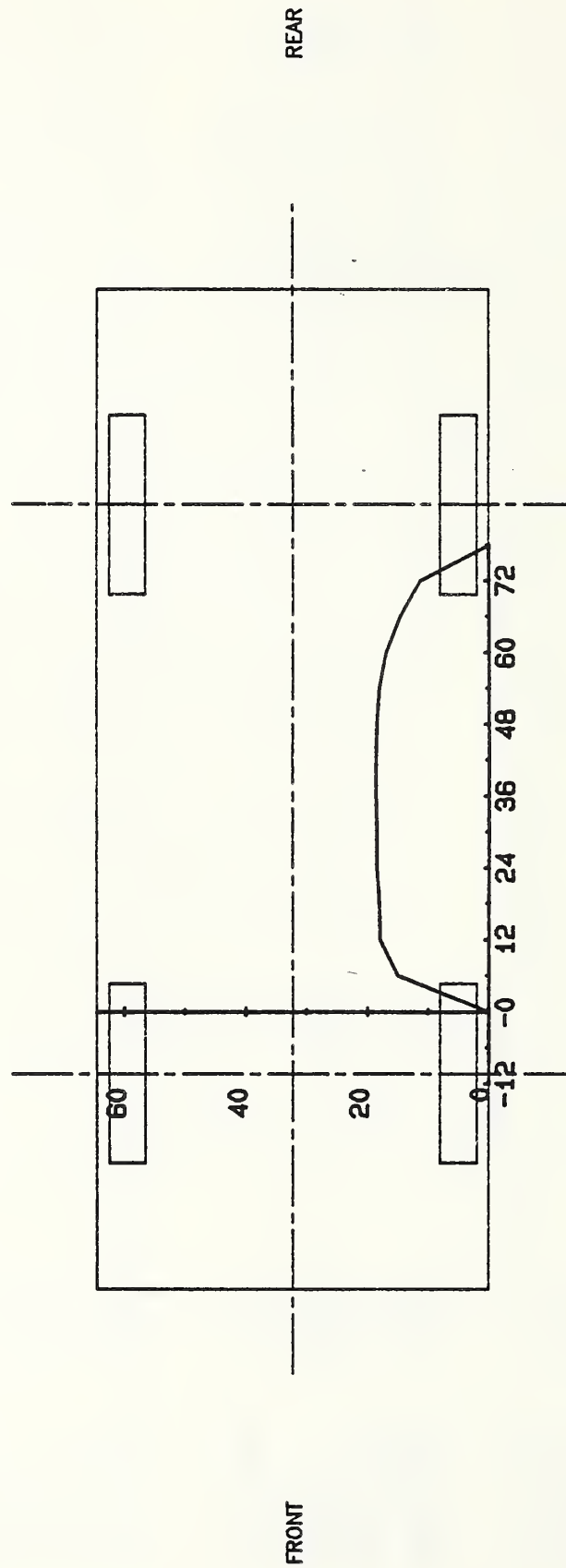
\*\* Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

# VEHICLE EXTERIOR STATIC CRUSH PROFILE



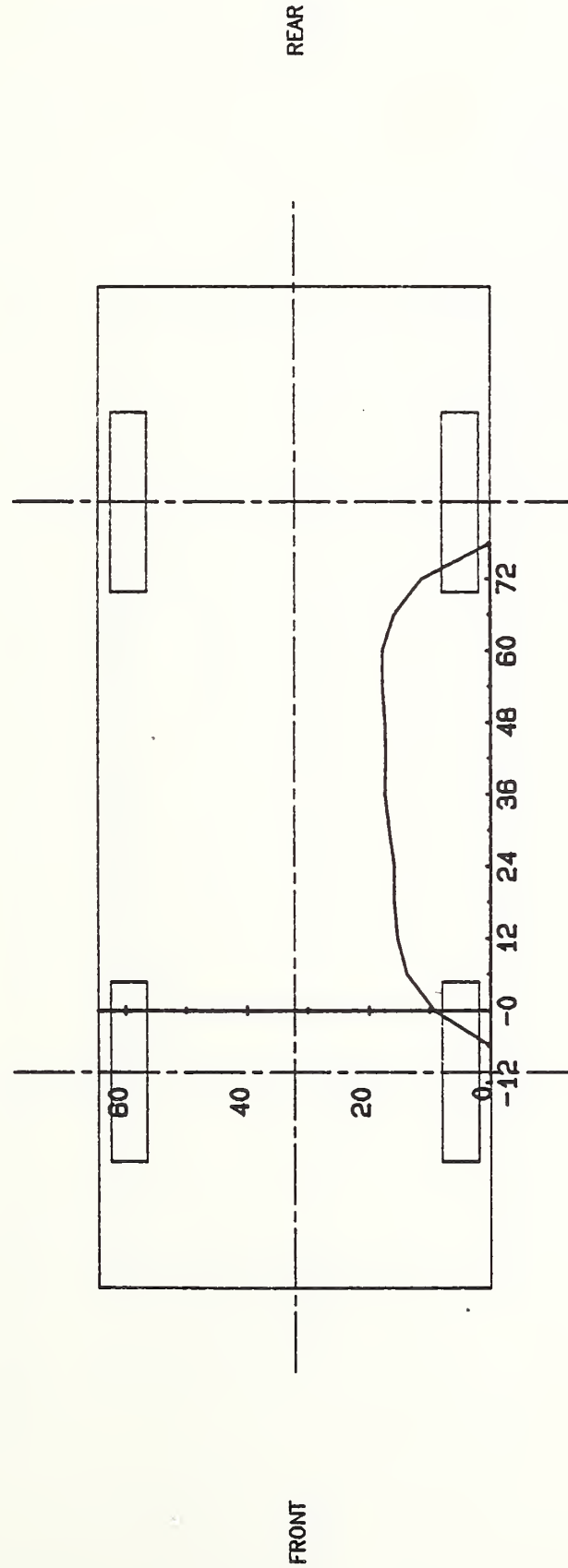
PROFILE LEVEL EQUALS AXLE HEIGHT  
 (0,0) EQUALS PROJECTED IMPACT POINT  
 SCALE FACTOR EQUALS 0.036

# VEHICLE EXTERIOR STATIC CRUSH PROFILE



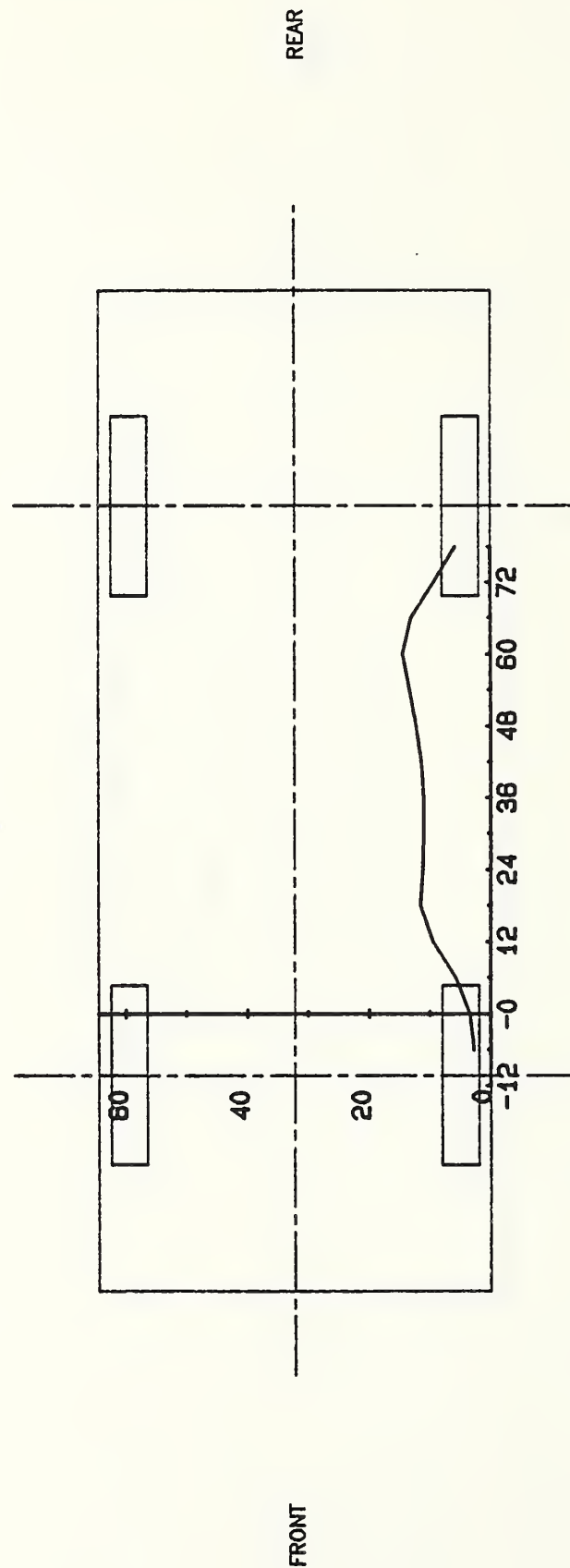
PROFILE LEVEL EQUALS H-POINT HEIGHT  
 (0,0) EQUALS PROJECTED IMPACT POINT  
 SCALE FACTOR EQUALS 0.036

# VEHICLE EXTERIOR STATIC CRUSH PROFILE



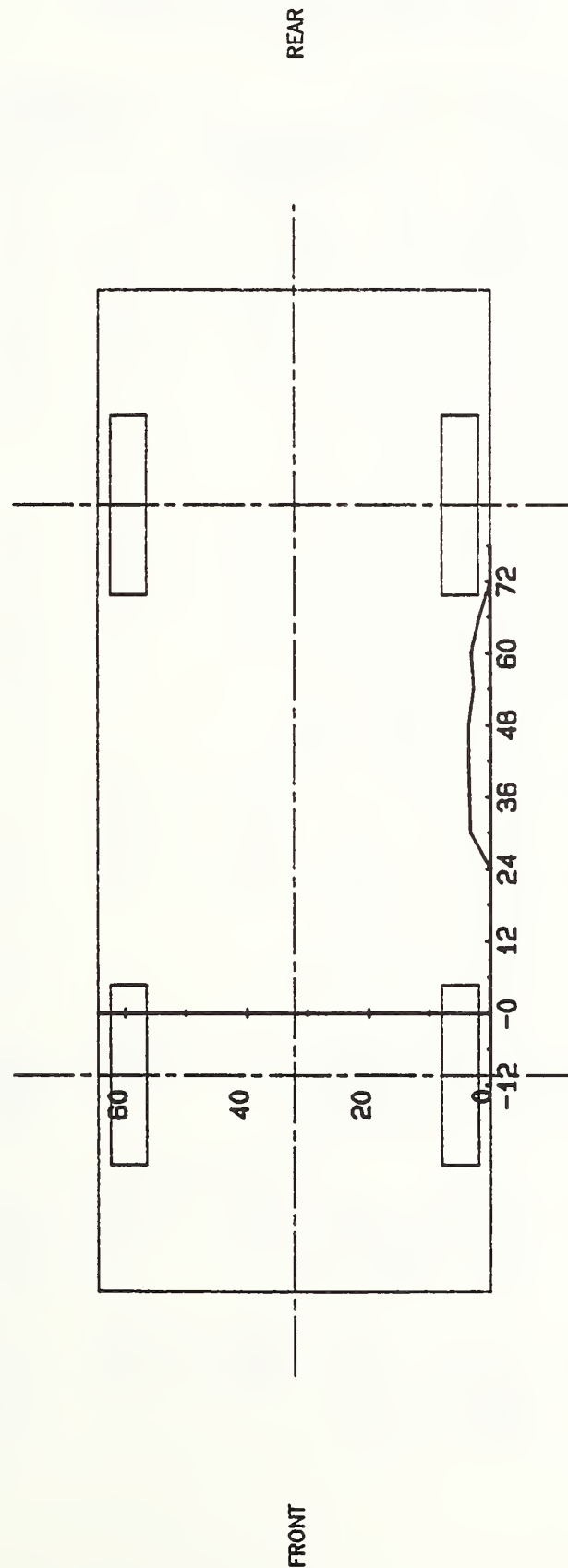
PROFILE LEVEL EQUALS MID DOOR HEIGHT  
 (0,0) EQUALS PROJECTED IMPACT POINT  
 SCALE FACTOR EQUALS 0.036

# VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT  
 (0,0) EQUALS PROJECTED IMPACT POINT  
 SCALE FACTOR EQUALS 0.036

# VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT  
 (0,0) EQUALS PROJECTED IMPACT POINT  
 SCALE FACTOR EQUALS 0.036

# SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**		POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION								
LONGITUDINAL	9.94	60.50	82.09	78.88	9.42	40.25	33.20	55.88
LATERAL	89.62	78.13	37.63	59.63	135.23	58.00	13.98	42.00
VERTICAL	63.70	45.63	87.66	58.38	40.56	63.38	26.80	43.25
RESULTANT		121.85 @ 79.00				141.09 @ 58.13		
HIC	1209.01	from 43.50 to 82.38			1238.54	from 54.38 to 62.13		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	21.97	40.88	25.59	37.50	14.51	76.88	24.90	66.87
LATERAL (P)***	148.45	38.75	46.87	63.75	74.81	48.13	18.35	65.00
LATERAL (R)***	154.40	38.75	46.76	63.75	76.10	48.13	17.73	65.00
VERTICAL	12.90	55.63	35.95	28.13	11.07	31.88	22.95	48.13
RESULTANT (P)		149.98 @ 38.75				81.72 @ 48.13		
RESULTANT (R)		155.87 @ 38.75				82.91 @ 48.13		
DELTA V (MPH)****		29.9 @ 58.75 (P)				21.4 @ 111.88 (P)		
		31.9 @ 58.75 (R)				22.2 @ 112.50 (R)		
LOWER SPINE								
LONGITUDINAL	43.47	51.88	23.47	64.38	19.90	58.75	21.07	65.63
LATERAL (P)	---	--- Y	---	---Y	57.62	40.00	22.74	65.63
LATERAL (R)	115.73	30.62	23.49	55.63	57.55	40.00	23.56	65.63
VERTICAL	36.93	34.38	25.48	27.50	14.48	42.50	12.88	69.38
RESULTANT (P)		--- @ --- Y				59.63 @ 40.63		
RESULTANT (R)		116.11 @ 30.62				59.71 @ 40.63		
DELTA V (MPH)		--- @ --- (P) Y				24.7 @ 61.25 (P)		
		34.1 @ 52.50 (R)				24.6 @ 60.62 (R)		
LEFT UPPER RIB								
LATERAL (P)	104.32	36.88	9.75	83.75	91.02	41.25	4.72	116.98
LATERAL (R)	---	--- Y	---	--- Y	90.78	41.25	8.18	73.75
DELTA V (MPH)		32.6 @ 80.00 (P)				24.0 @ 98.75 (P)		
		--- @ --- (R) Y				25.2 @ 99.37 (R)		
LEFT LOWER RIB								
LATERAL (P)	107.94	32.50	16.94	68.13	103.07	40.63	38.59	69.38
LATERAL (R)	129.79	34.38	18.90	68.13	98.68	40.63	36.91	70.00
DELTA V (MPH)		26.7 @ 82.50 (P)				26.2 @ 67.50 (P)		
		32.2 @ 103.10 (R)				26.3 @ 67.50 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	6.63	42.88	39.02	36.38	13.55	67.38	85.18	35.13
LATERAL	239.91	27.75	27.25	39.25	155.42	34.13	14.12	24.00
VERTICAL	28.38	29.00	19.61	26.88	51.22	38.88	12.63	72.75
RESULTANT		239.91 @ 27.75				170.02 @ 34.88		
DELTA V (MPH)		31.3 @ 79.38				23.9 @ 51.00		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	<u>DRIVER DUMMY</u>				<u>PASSENGER DUMMY</u>			
	<u>POSITIVE</u> <u>DIRECTION*</u>		<u>NEGATIVE</u> <u>DIRECTION**</u>		<u>POSITIVE</u> <u>DIRECTION*</u>		<u>NEGATIVE</u> <u>DIRECTION**</u>	
	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>	<u>MAX</u> <u>(in)</u>	<u>TIME</u> <u>(msec)</u>
RIB DEFLECTION †	1.45	93.13	0.06	330.75	1.78	64.75	0.02	1.38

\* LONGITUDINAL: FORWARD  
 LATERAL: RIGHTWARD  
 VERTICAL: UPWARD

\*\*LONGITUDINAL: REARWARD  
 LATERAL: LEFTWARD  
 VERTICAL: DOWNWARD

\*\*\* (P) = Primary Sensor, (R) = Redundant Sensor

\*\*\*\* For dummy channels, Delta V is the velocity change at the approximate time of separation from the contact area.

† Compression: Positive

Υ See TEST ANOMALIES

# VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

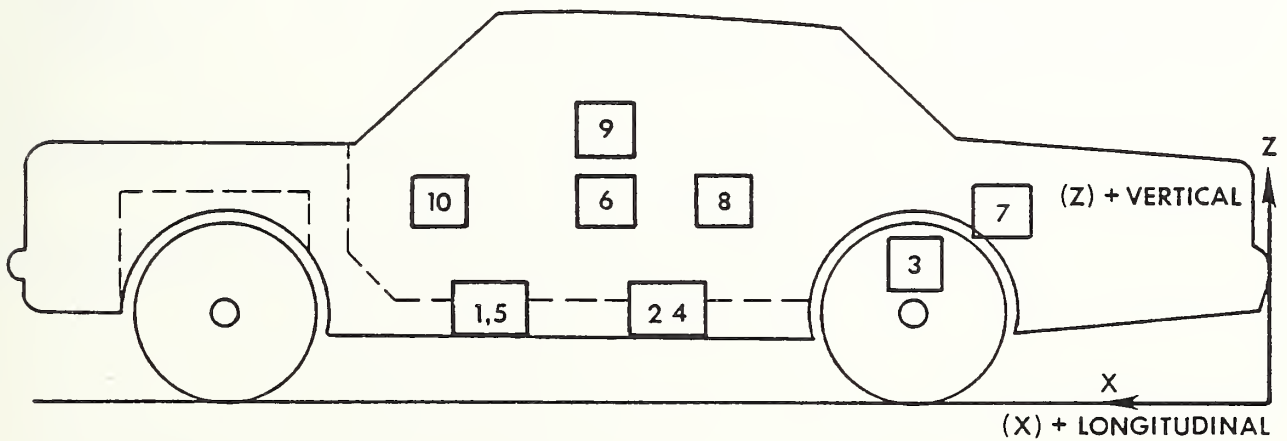
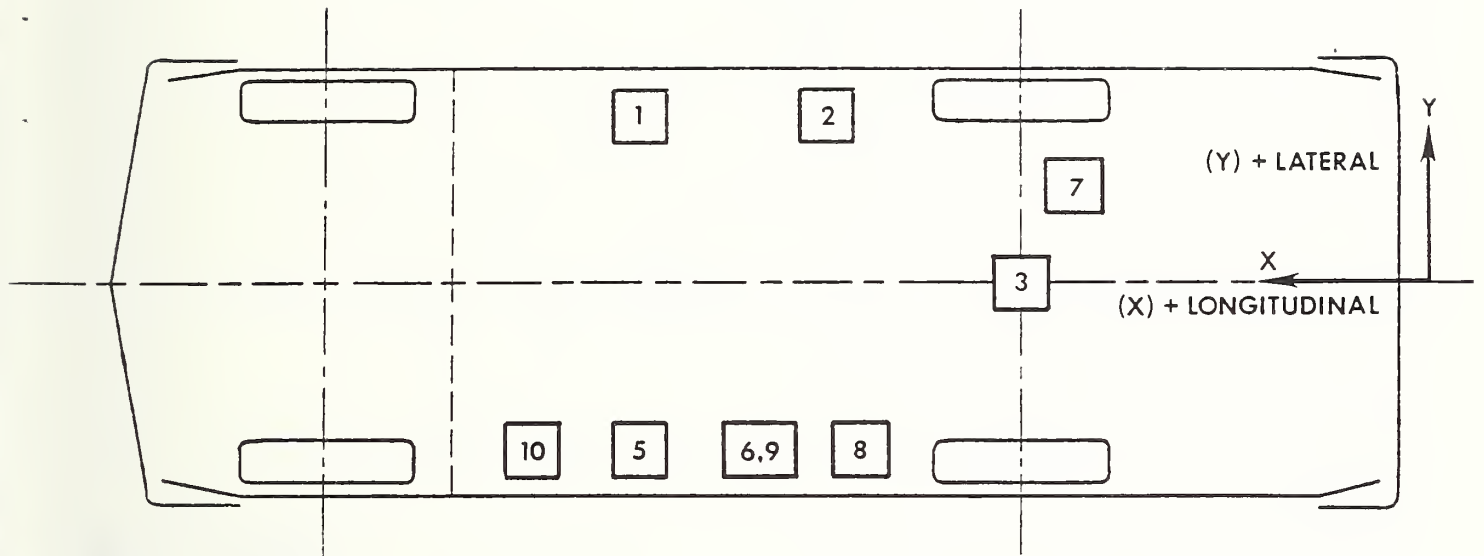
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	96.8	26.1	7.0				
	(LATERAL)	$\Delta V = -0.4$ mph @ 120.00 msec			3.11	66.63	4.83	29.63
	(VERTICAL)	$\Delta V = 15.0$ mph @ 120.00 msec			16.03	36.38	2.14	168.75
	(RESULTANT)				4.91	28.50	5.42	56.00
						16.26 @ 36.50		
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	66.8	26.0	10.6				
	(LATERAL)	$\Delta V = -0.9$ mph @ 120.00 msec			3.10	75.13	4.52	27.25
	(VERTICAL)	$\Delta V = 17.3$ mph @ 120.00 msec			18.30	27.13	2.75	166.63
	(RESULTANT)				5.84	26.00	3.29	93.75
						19.67 @ 27.00		
3	REAR DECK OVER AXLE (LONGITUDINAL)	39.5	0.0	12.2				
	(LATERAL)	$\Delta V = -3.7$ mph @ 120.00 msec			2.04	10.38	12.91	23.63
	(VERTICAL)	$\Delta V = 21.1$ mph @ 120.00 msec			19.28	26.50	2.88	227.13
	(RESULTANT)				15.64	25.63	29.43	29.88
						31.62 @ 29.75		
4	LEFT SILL AT REAR SEAT (LATERAL)	67.0	-25.5	9.8				
		$\Delta V = 11.6$ mph @ 66.38 msec			42.00	24.13	31.48	16.88
5	LEFT SILL AT FRONT SEAT (LATERAL)	96.9	-26.0	9.5	---	---	---	---
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	92.2	-26.3	24.1				
		$\Delta V = 26.6$ mph @ 13.13 msec			230.66	13.00	84.23	21.25
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	26.6	20.2	17.5				
					2.42	60.00	8.11	24.38
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	84.1	-26.7	24.1				
		$\Delta V = 22.2$ mph @ 10.50 msec			198.95	11.75	36.02	18.25
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	92.2	-26.6	30.4	---	---	---	---
10	MIDREAR OF LEFT FRONT DOOR (LATERAL)	100.8	-25.9	24.2				
		$\Delta V = 19.0$ mph @ 22.63 msec			75.45	14.50	81.19	30.00

\* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right),  
Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

YSee TEST ANOMALIES

# VEHICLE ACCELEROMETER LOCATIONS



# YAW RATE GYRO LOCATION AND DATA SUMMARY

LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
				MAX (deg/sec)	TIME (msec)	MAX (deg/sec)	TIME (msec)
YAW RATE GYRO	102.5	0.0	16.1	---	--- Y	---	--- Y

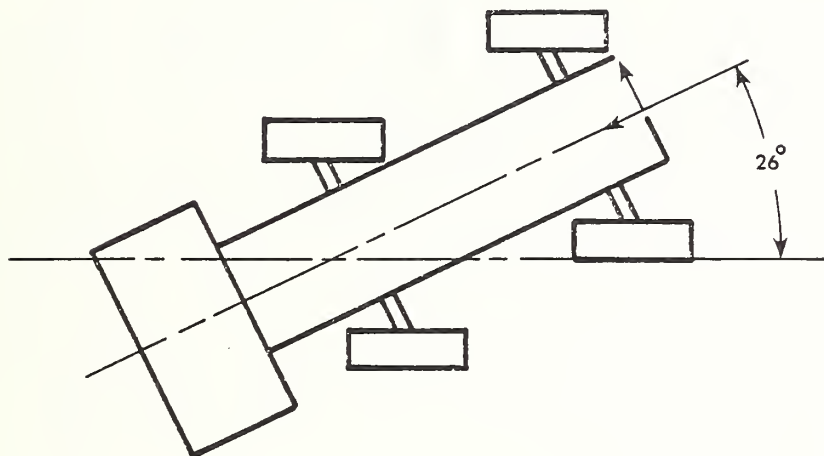
\*Reference: X - Rear Bumper (+ forward), Y - Vehicle Centerline (+ to right),  
Z - Ground Level (+ up)

All measurements of rate gyro in inches.

Yaw rotation is positive when measured counterclockwise as viewed from above.

Y See TEST ANOMALIES

# MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	73.5	0.0	12.8				
	(LONGITUDINAL)	$\Delta V = -16.7 \text{ mph @ } 120.00 \text{ msec}$			0.64	143.00	14.29	44.75
	(LATERAL)	$\Delta V = -3.9 \text{ mph @ } 120.00 \text{ msec}$			1.53	81.00	7.62	32.38
	(VERTICAL)				2.79	46.25	3.49	31.75
	(RESULTANT)					15.19 @ 45.13		
2	REAR FRAME MEMBER	19.4	-18.5	12.7				
	(LONGITUDINAL)	$\Delta V = -15.7 \text{ mph @ } 120.00 \text{ msec}$			2.18	152.88	15.17	44.25
	(LATERAL)	$\Delta V = -0.6 \text{ mph @ } 120.00 \text{ msec}$			2.55	24.00	2.74	164.13

\* Reference: X - Rear Most Point of Frame (+ To Forward), Y - Barrier Centerline (+ To Right), Z - Ground Level (+ To Up)

All measurements of accelerometer locations in inches.

# CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Onboard MDB - Tight	Photosonic 1B	25	500	Closeup of impact point
2	Onboard MDB - Wide	Photosonic 1B	13	500	Dummy kinematics
3	Overhead - Tight	Photosonic 1B	25	425	Closeup of impact point
4	Overhead - Wide	Photosonic 1B	8	465	Vehicle dynamics
5	Ground Level - Right	Photosonic 1B	25	503	Overall view
6	Ground Level - Left	Photosonic 1B	17	---	Overall view
7	Onboard Windshield	Photosonic 1B	8	802	Driver kinematics - front view
8	Onboard Roof	Photosonic 1B	8	800	Door/Driver contact velocity
9	Onboard Driver	Photosonic 1B	8	800	Driver kinematics
10	Onboard Passenger	Photosonic 1B	8	805	Passenger kinematics

Y See TEST ANOMALIES

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	24'10"	58'8"	45"
6	-20'11"	-13'	45"

-----  
Origin of Coordinate System is Point of Impact

+X = Forward with Respect to Striking Vehicle's Velocity Vector  
+Y = Rightward with Respect to Striking Vehicle's Velocity Vector  
+Z = Upward with Respect to Striking Vehicle's Velocity Vector

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BCGXG	Accel	4-202-0001	18851	Bell Howell	12/10/84	.242 MV/G	100 G
BCGYG	Accel	4-202-0001	18859	Bell Howell	12/10/84	.239 MV/G	100 G
BCGZG	Accel	4-202-0001	18847	Bell Howell	12/10/84	.246 MV/G	100 G
BRCXG	Accel	4-202-0001	18240	Bell Howell	11/8/84	.239 MV/G	100 G
BRCYG	Accel	4-202-0001	19022	Bell Howell	11/8/84	.220 MV/G	100 G

All dummy and struck vehicle accelerometers were Government Furnished Equipment and were Endevco 2264 Accelerometers.

APPENDIX A  
PHOTOGRAPHS

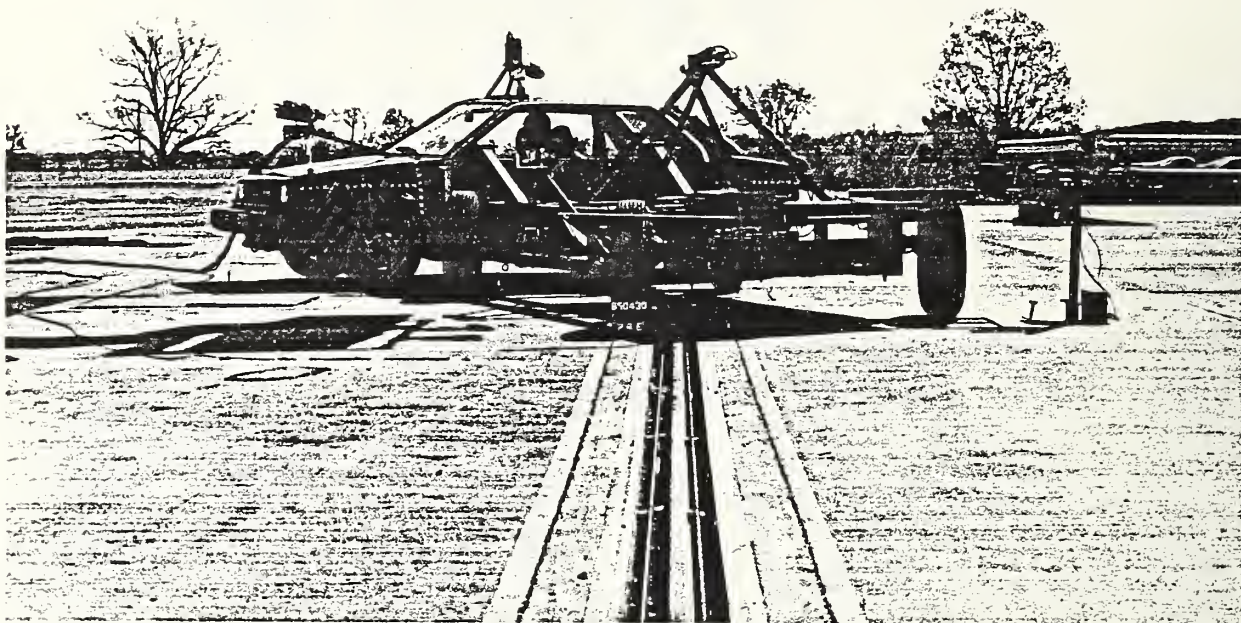


Figure A-1. PRE-TEST OVERALL - VIEW 1

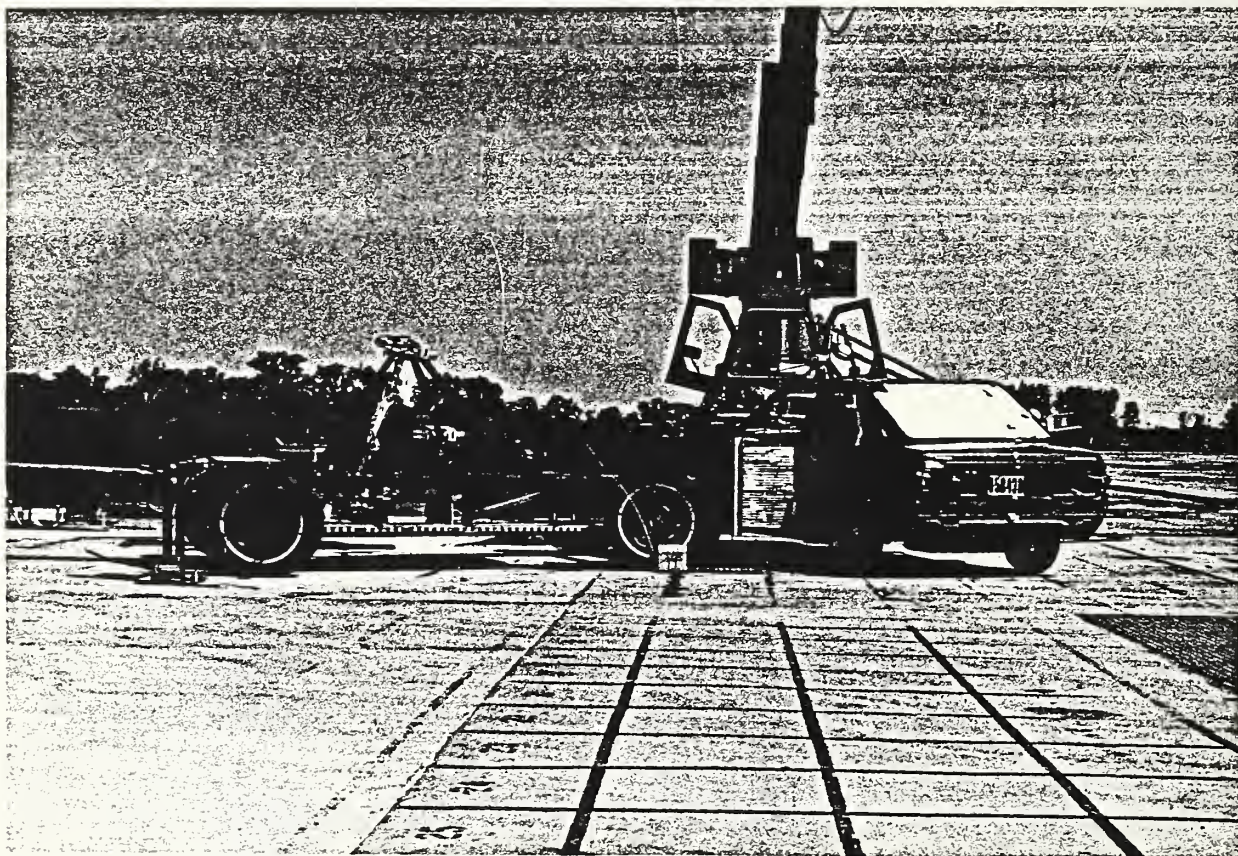


Figure A-2. PRE-TEST OVERALL - VIEW 2  
A-2

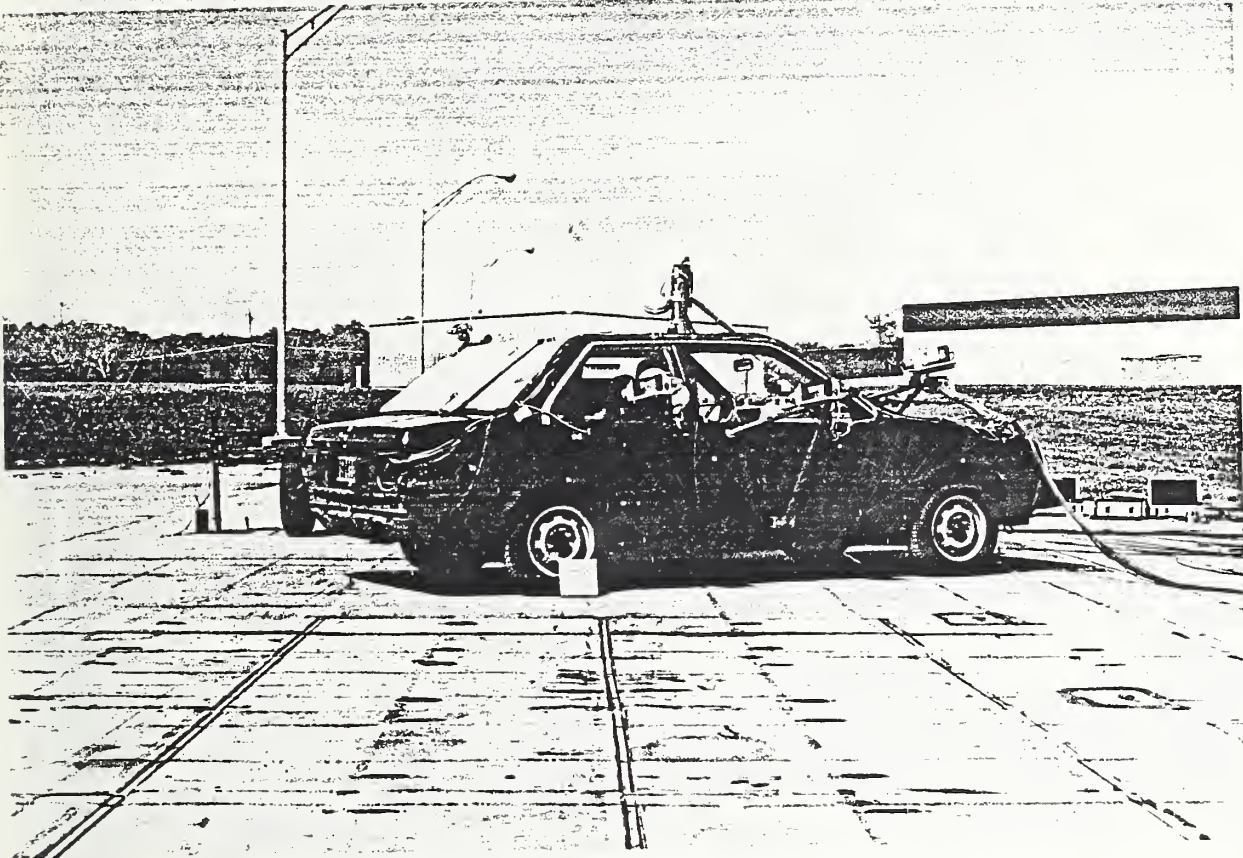


Figure A-3. PRE-TEST OVERALL - VIEW 3

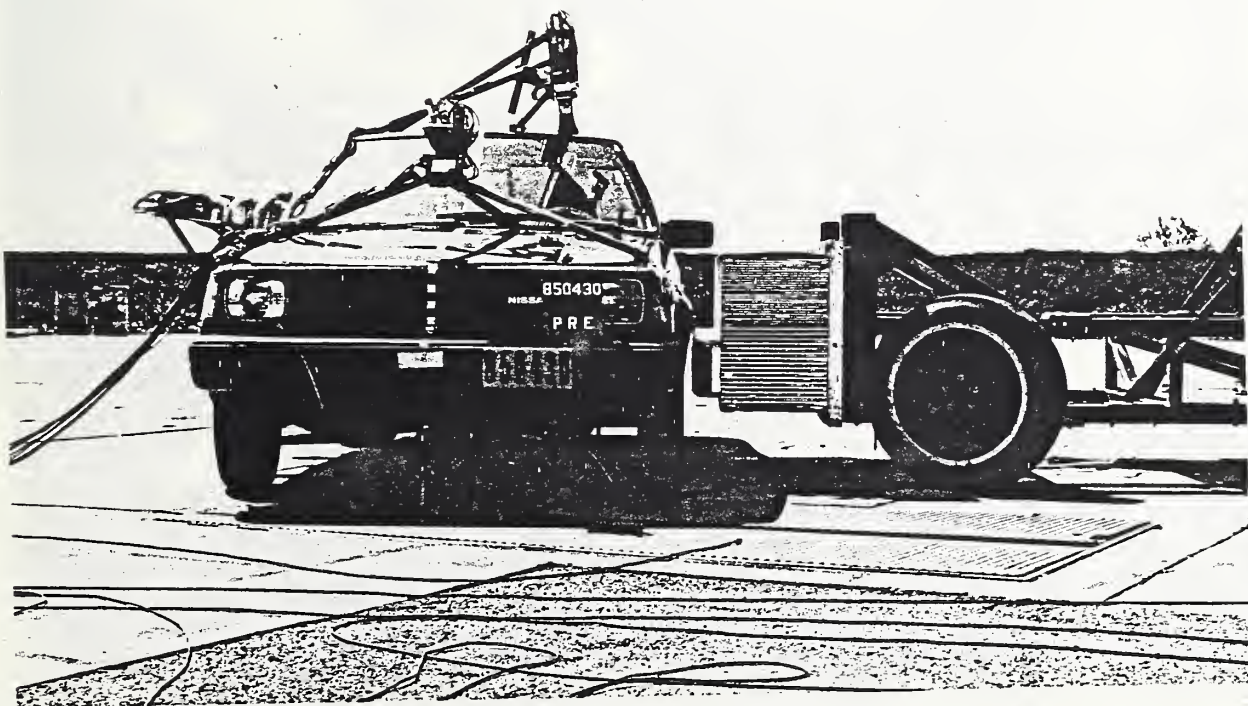


Figure A-4. PRE-TEST OVERALL - VIEW 4  
A-3



Figure A-5. PRE-TEST CLOSEUP - VIEW 1

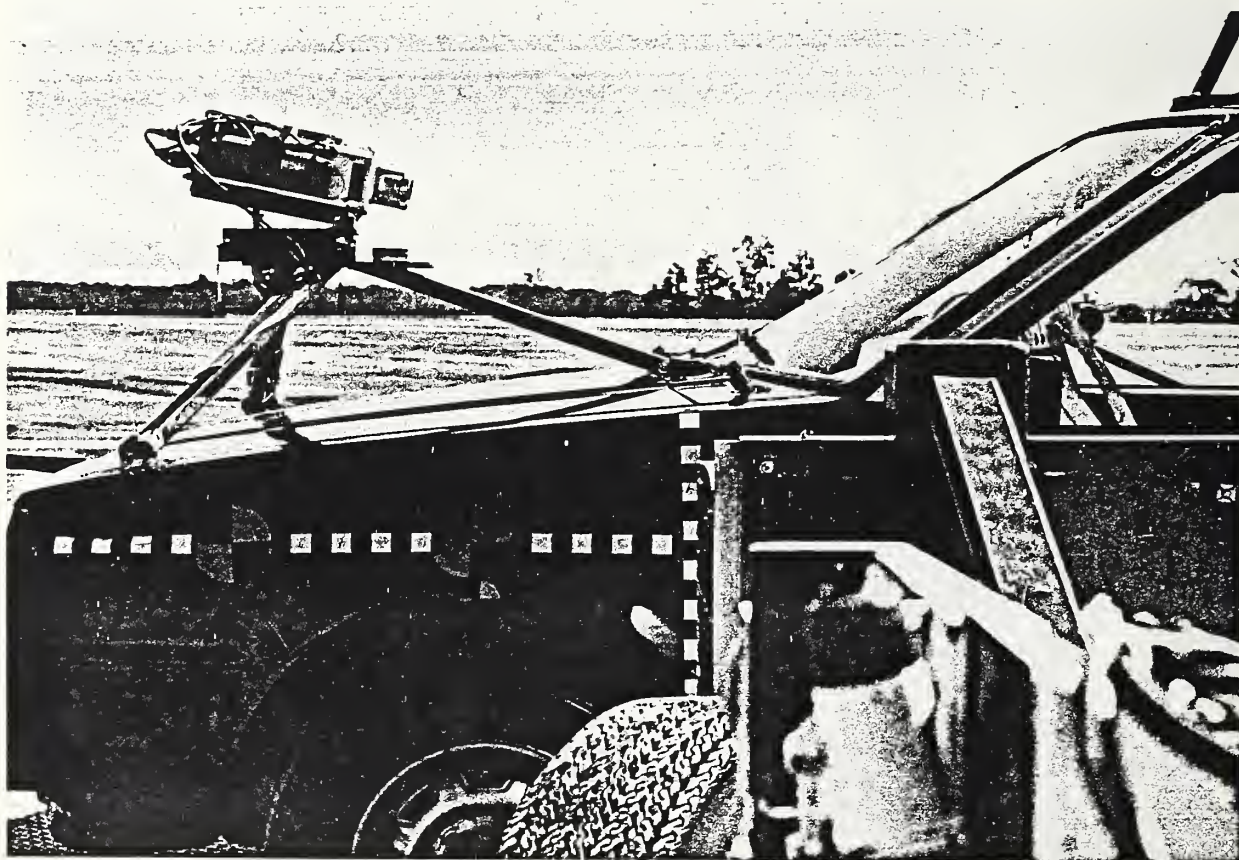


Figure A-6. PRE-TEST CLOSEUP - VIEW 2

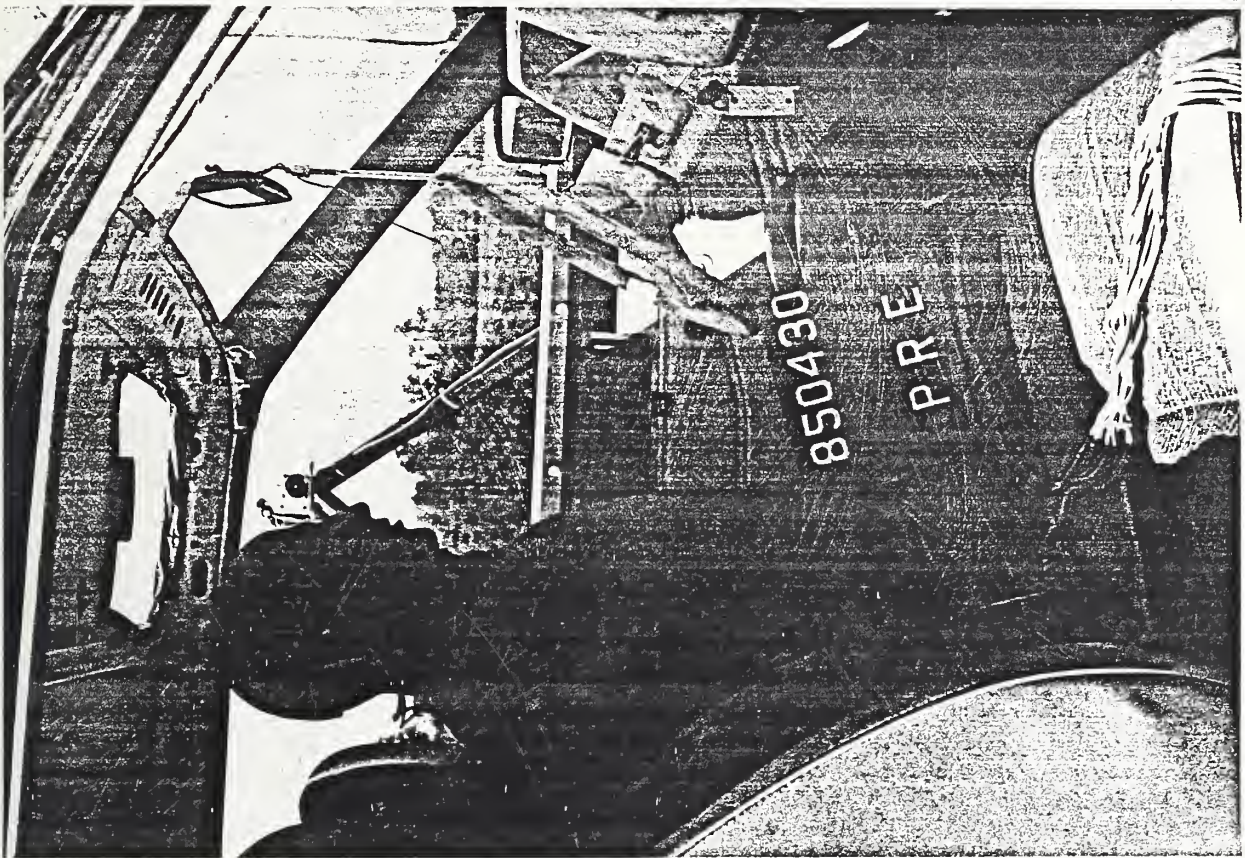


Figure A-7. PRE-TEST DRIVER DUMMY VIEW



Figure A-8. PRE-TEST PASSENGER DUMMY VIEW  
A-5



Figure A-9. CRASH EVENT PHOTOGRAPH

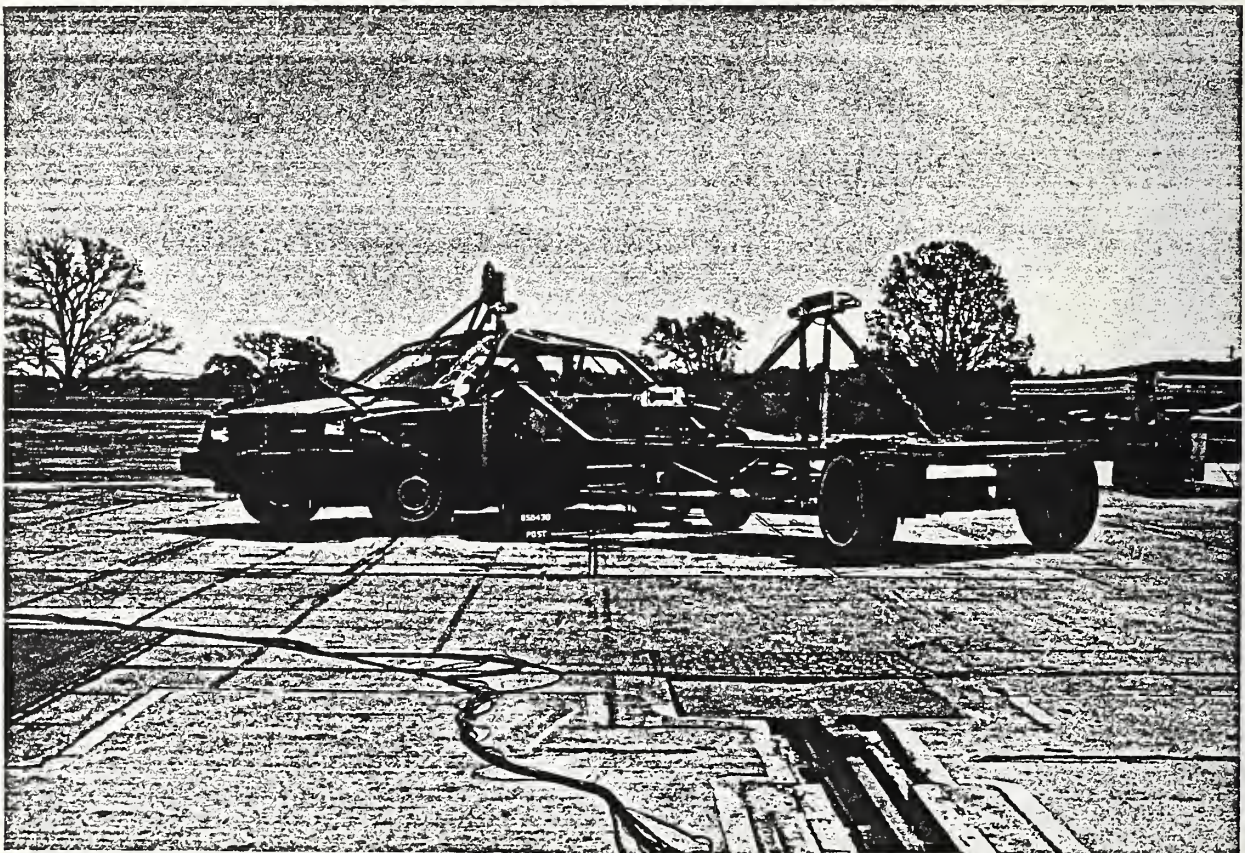


Figure A-10. POST-TEST OVERALL - VIEW 1  
A-6

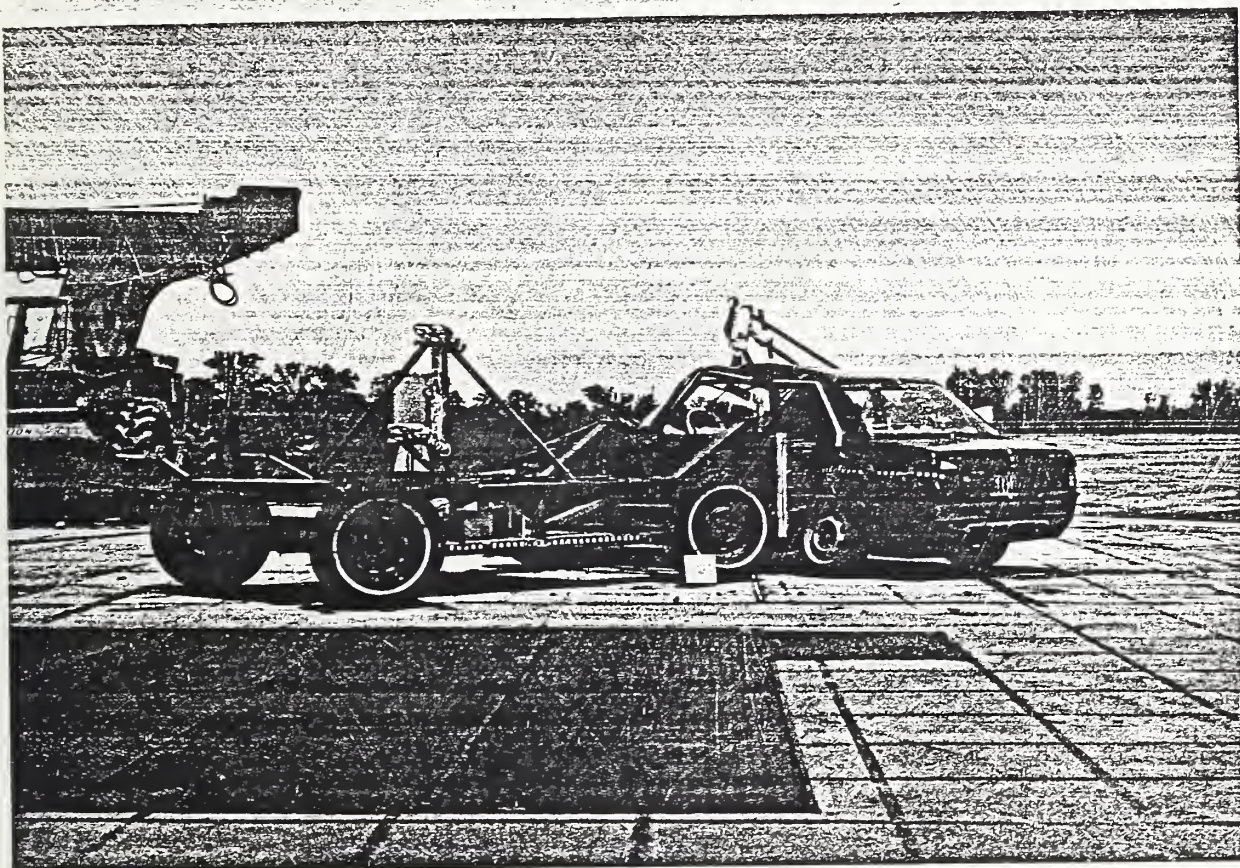


Figure A-11. POST-TEST OVERALL - VIEW 2



Figure A-12. POST-TEST OVERALL - VIEW 3  
A-7

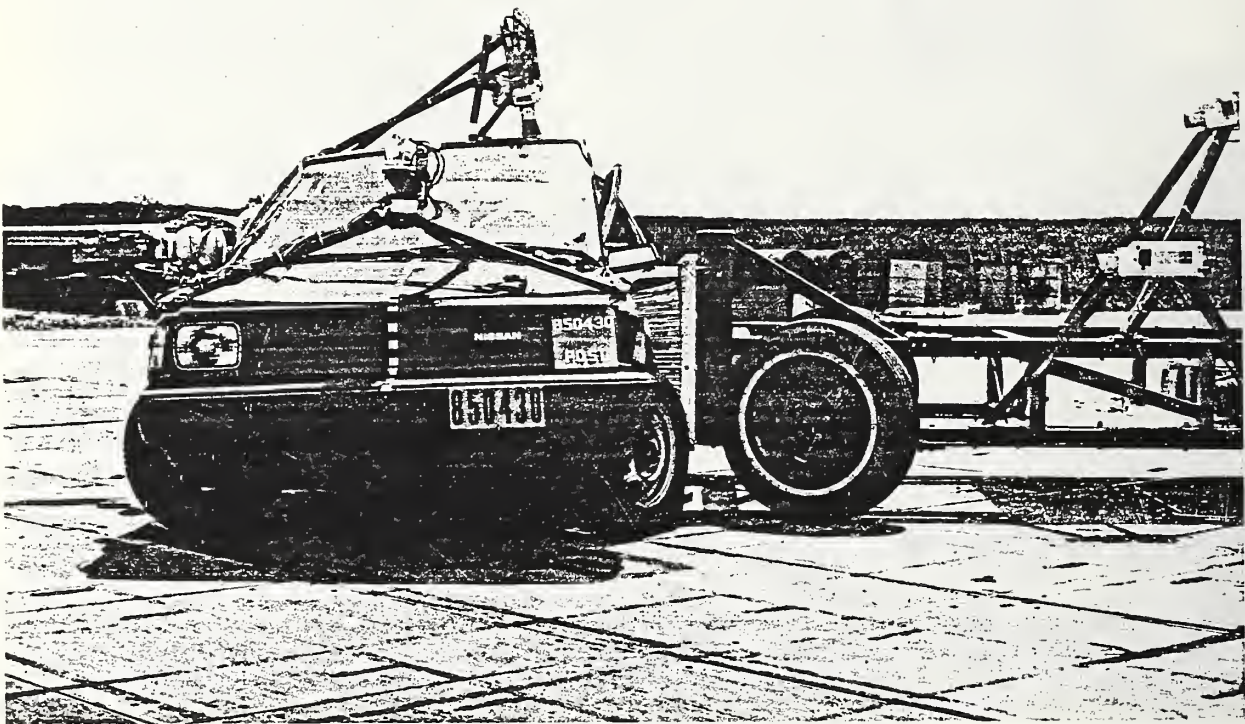


Figure A-13. POST-TEST OVERALL - VIEW 4

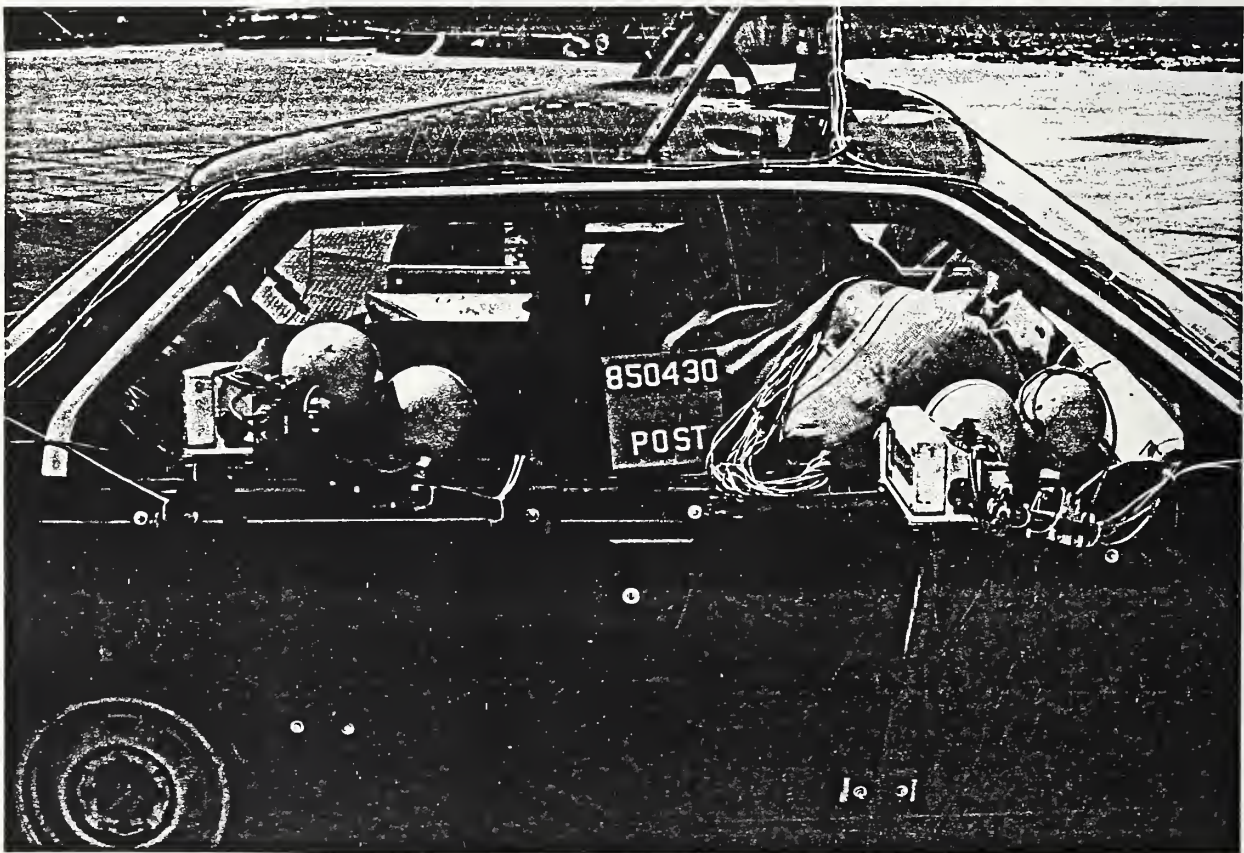


Figure A-14. POST-TEST CLOSEUP VIEW  
A-8



Figure A-15. POST-TEST DRIVER DUMMY VIEW



Figure A-16. POST-TEST PASSENGER DUMMY VIEW

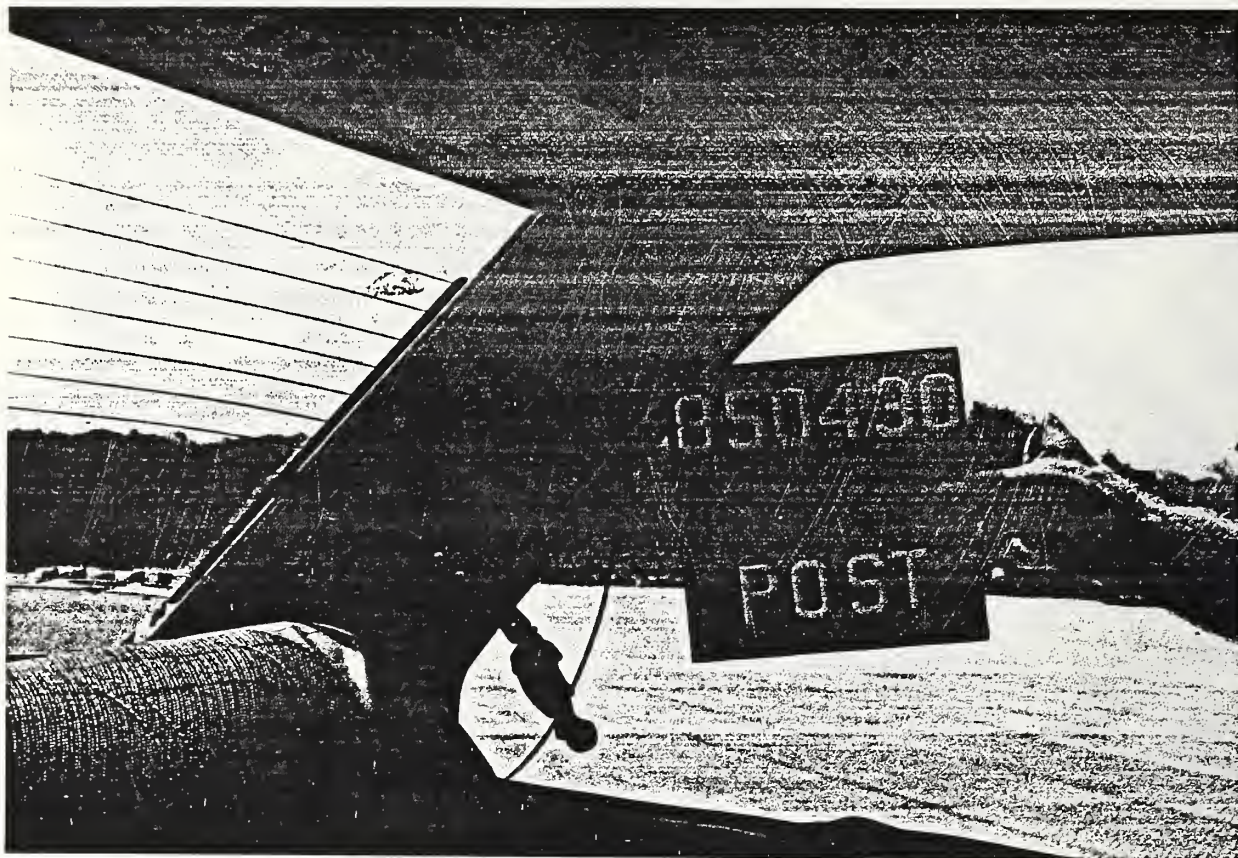


Figure A-17. PASSENGER DUMMY HEAD CONTACT POINTS

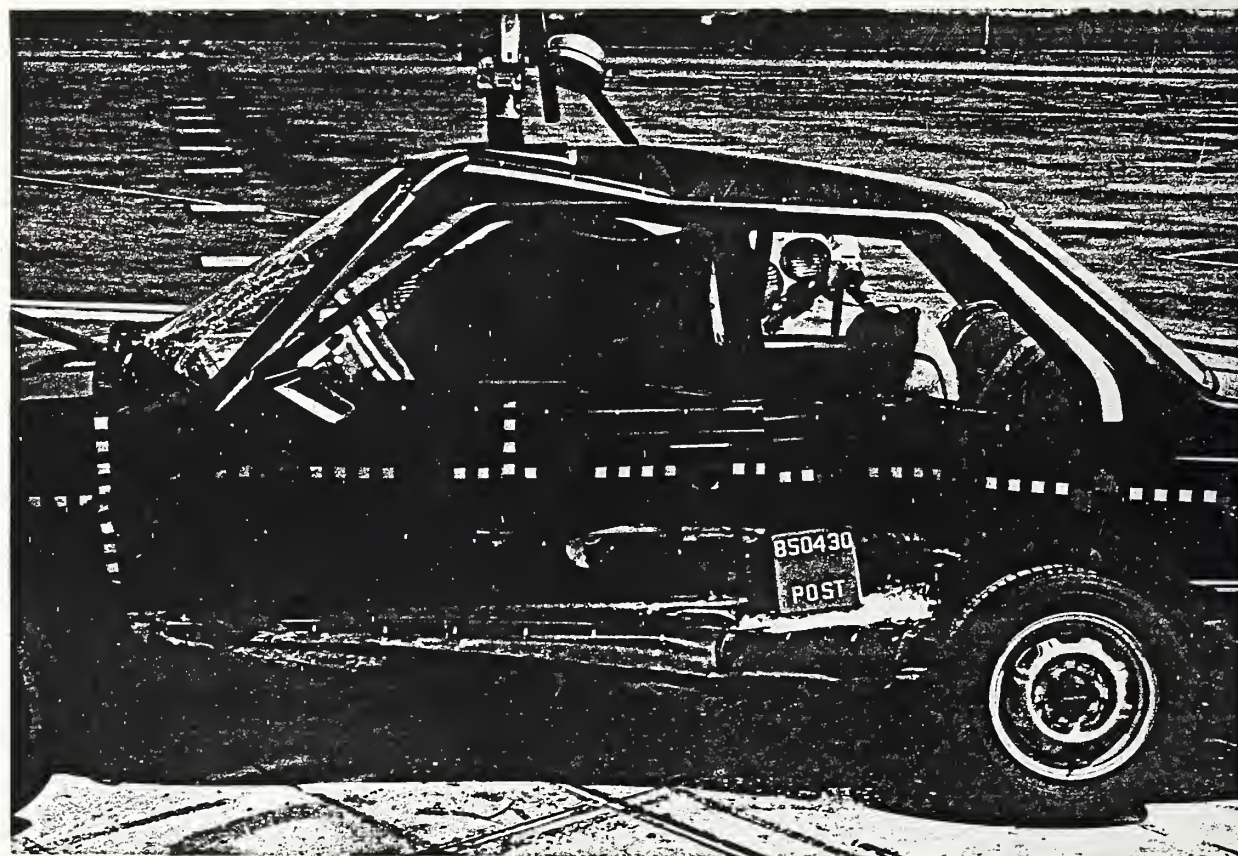


Figure A-18. POST-TEST VEHICLE DAMAGE - VIEW 1  
A-10

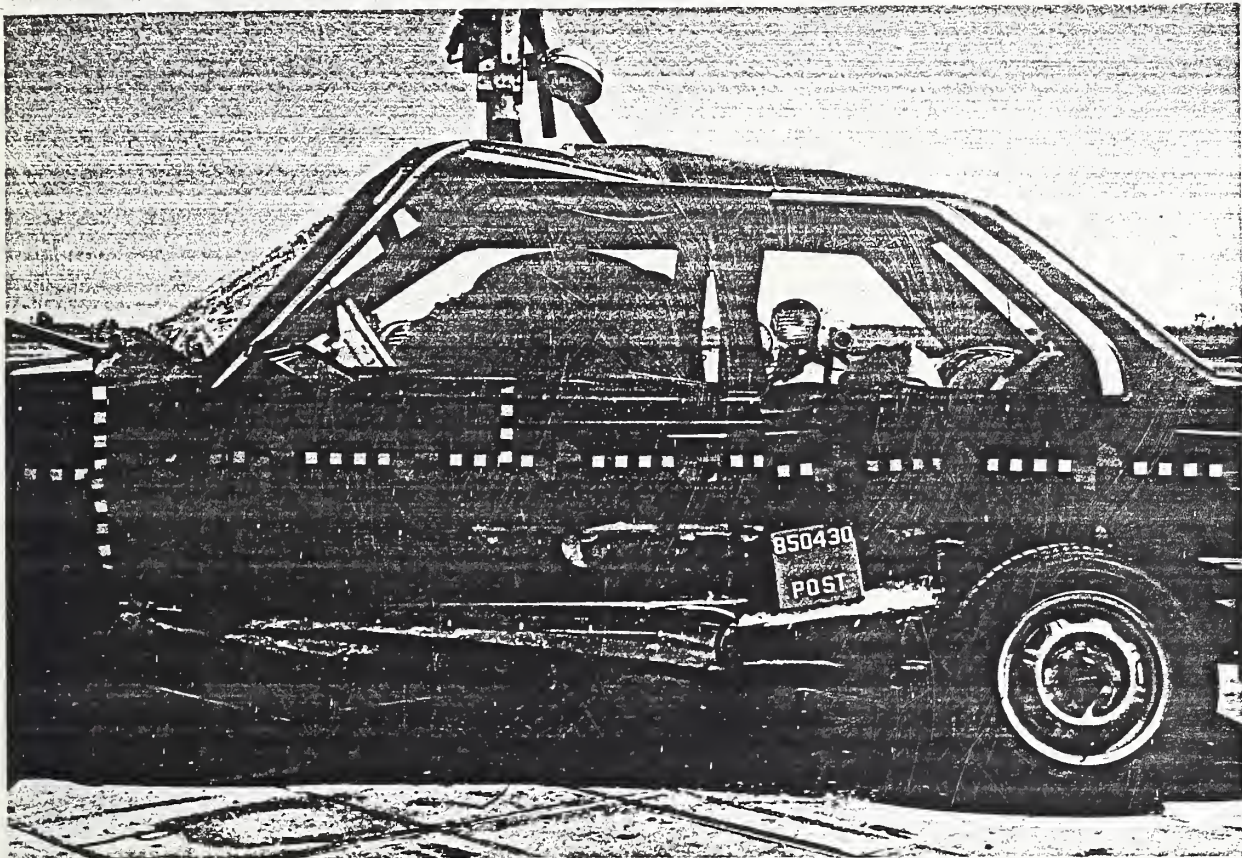


Figure A-19. POST-TEST VEHICLE DAMAGE - VIEW 2

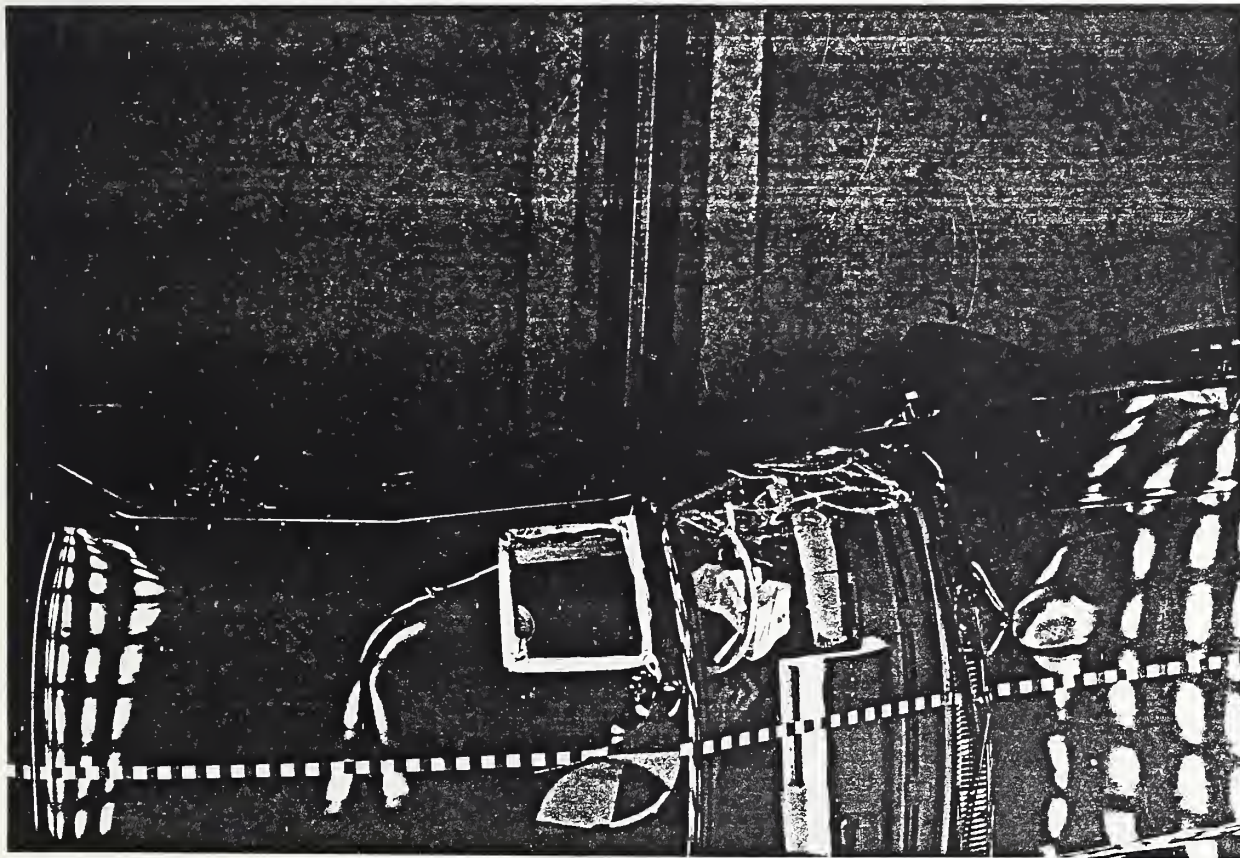


Figure A-20. POST-TEST OVERHEAD VIEW  
A-11

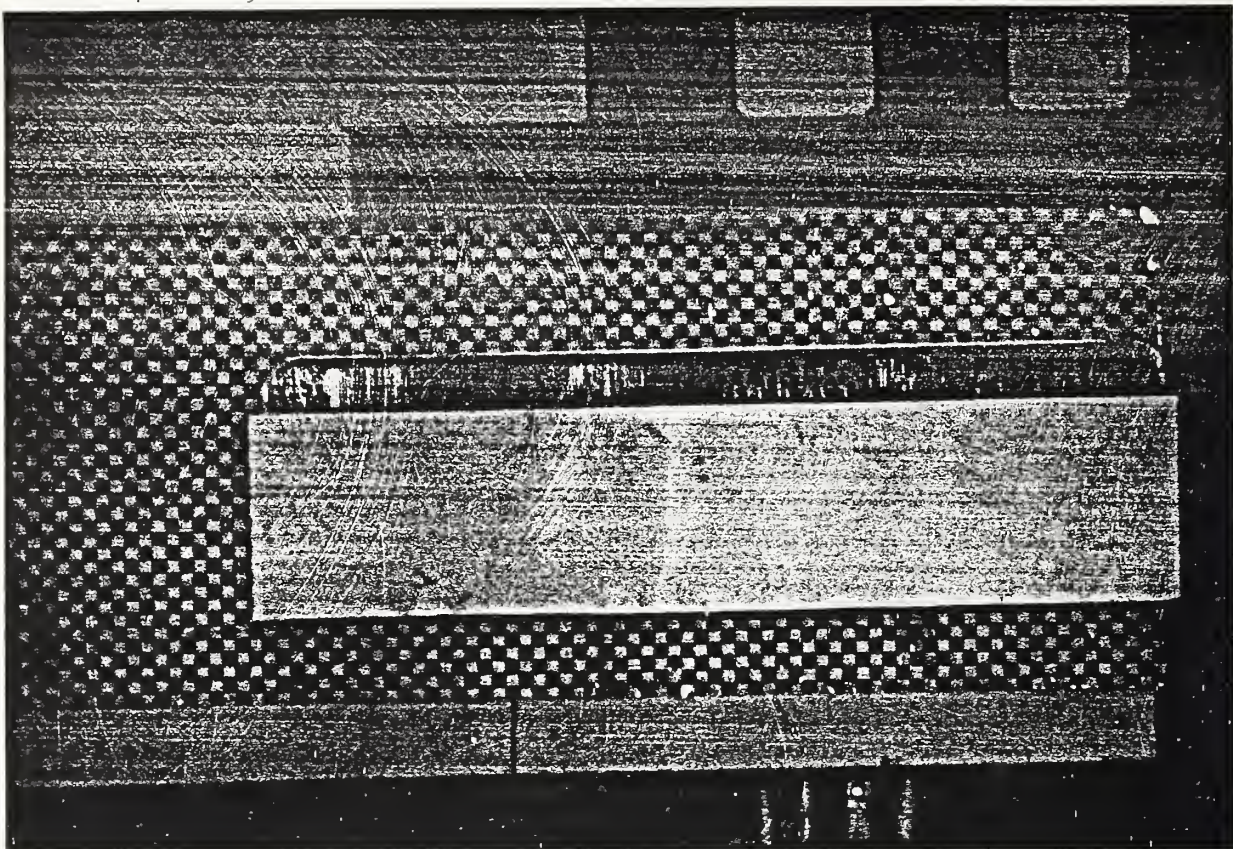


Figure A-21. PRE-TEST MDB FACE - VIEW 1

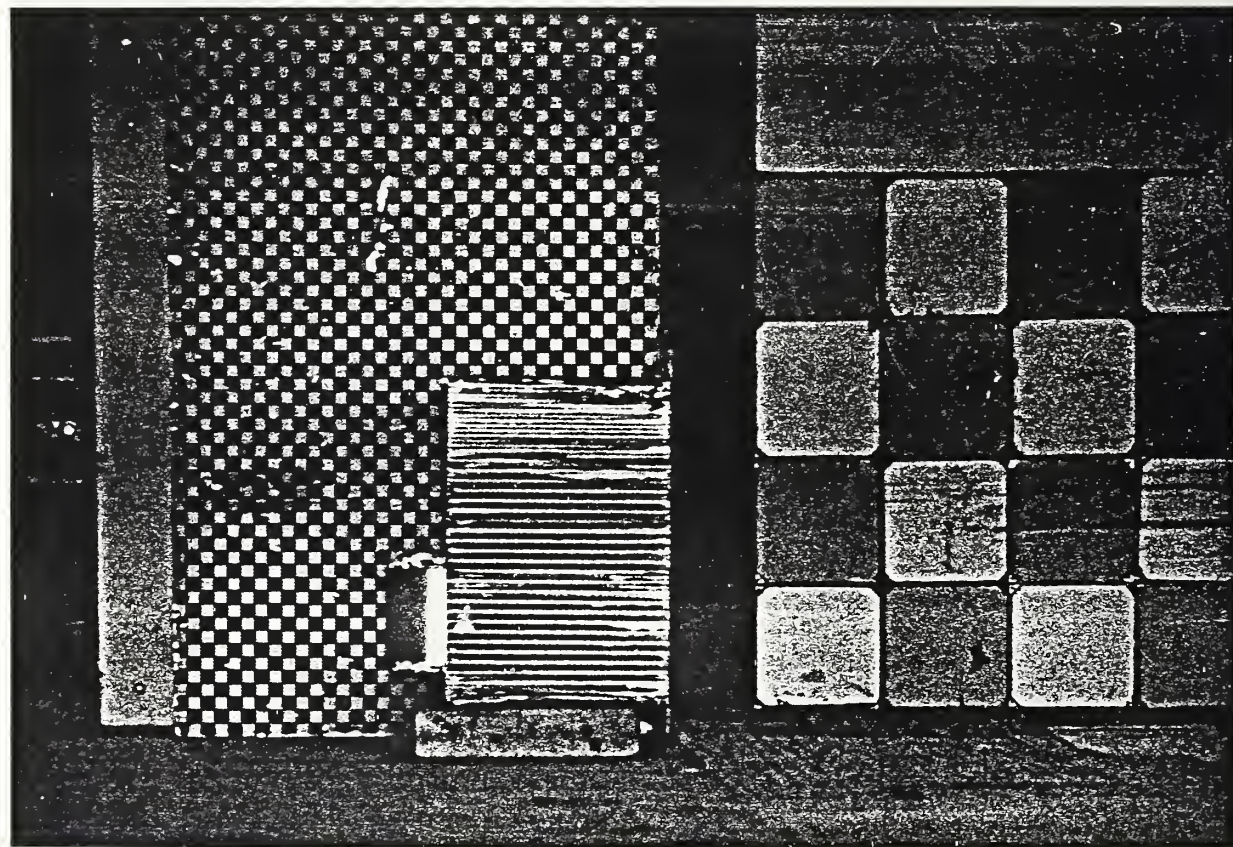


Figure A-22. PRE-TEST MDB FACE - VIEW 2  
A-12

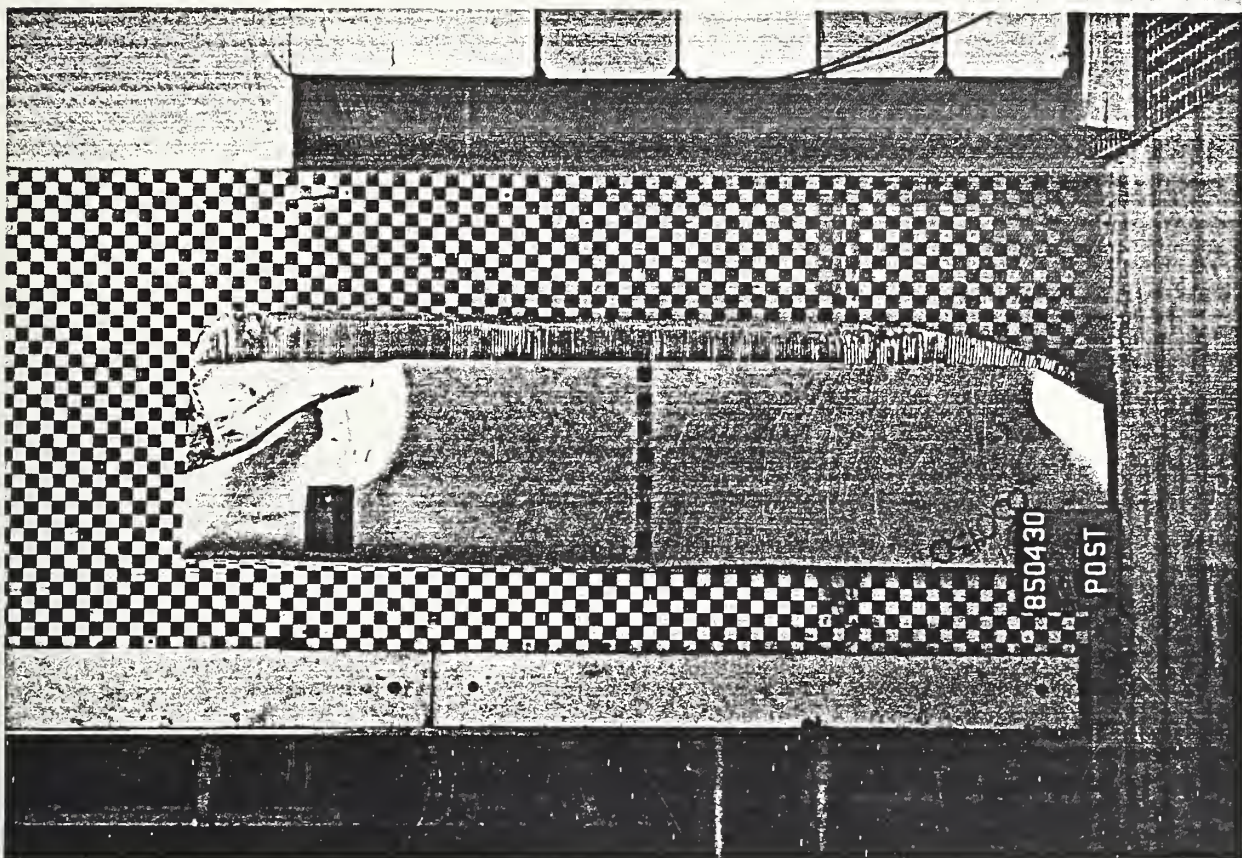


Figure A-23. POST-TEST MDB FACE - VIEW 1

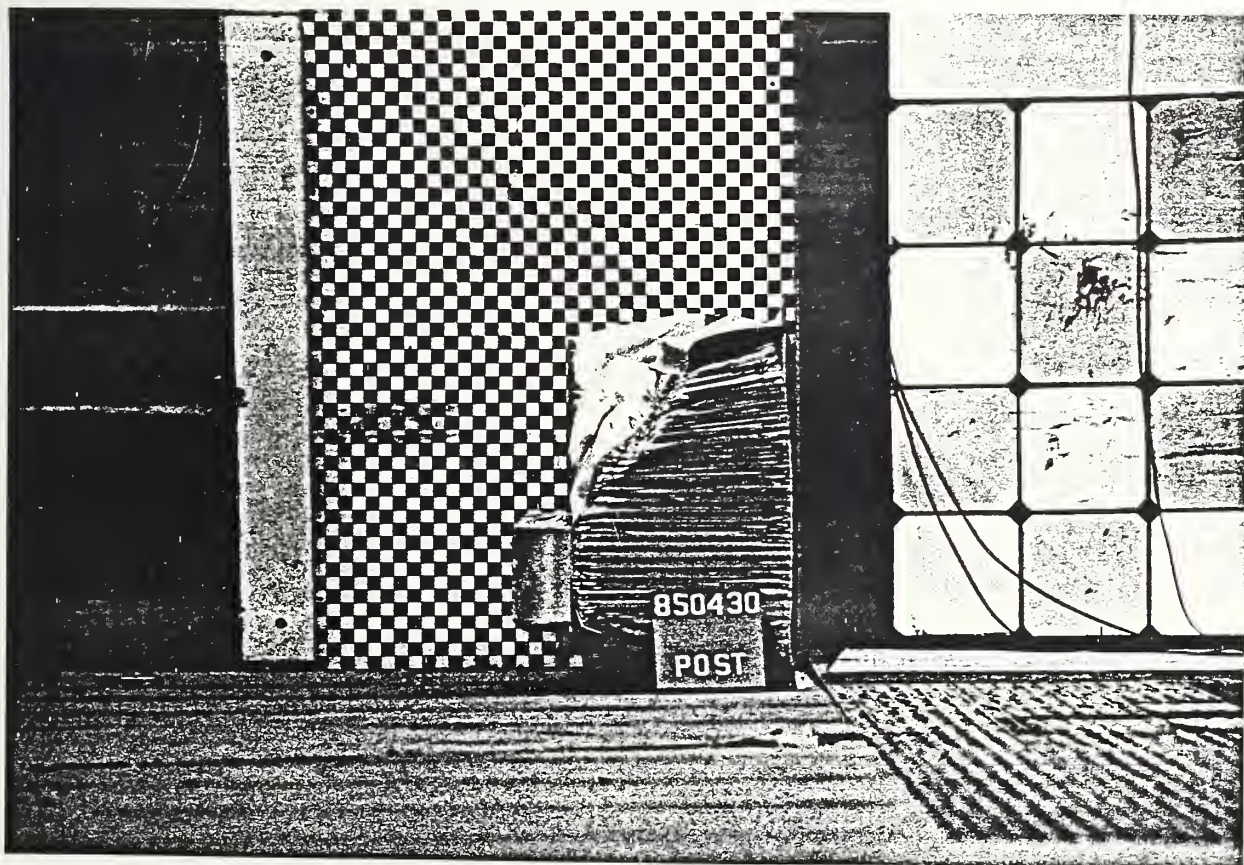


Figure A-24. POST-TEST MDB FACE - VIEW 2  
A-13



APPENDIX B  
DATA PLOT PRESENTATION

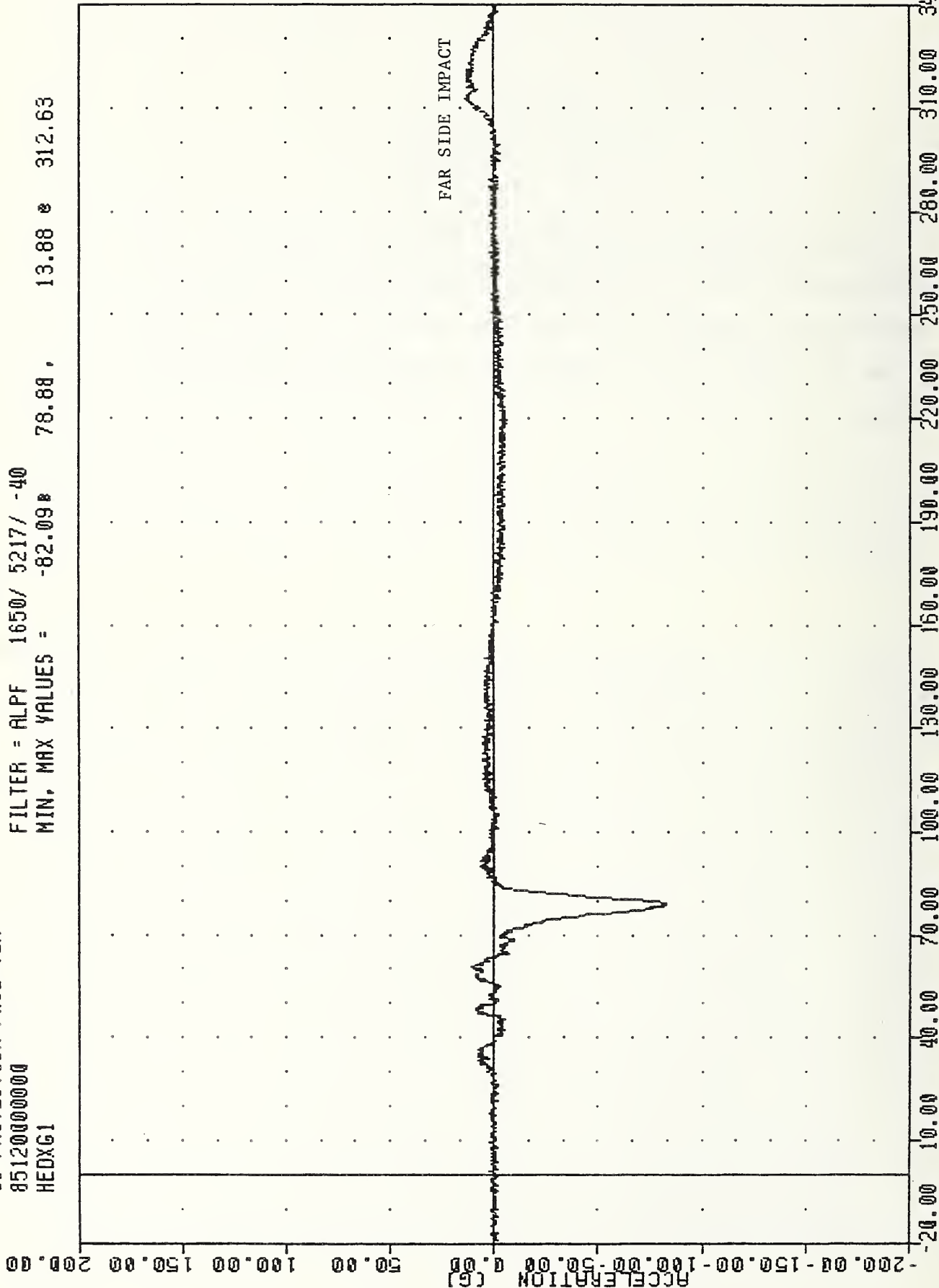
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

VRT , 850430  
SI PROTECTION PROD VEH  
85120000000  
HEDXC1

PLOT DATE 9-MAY-85 10:28:49

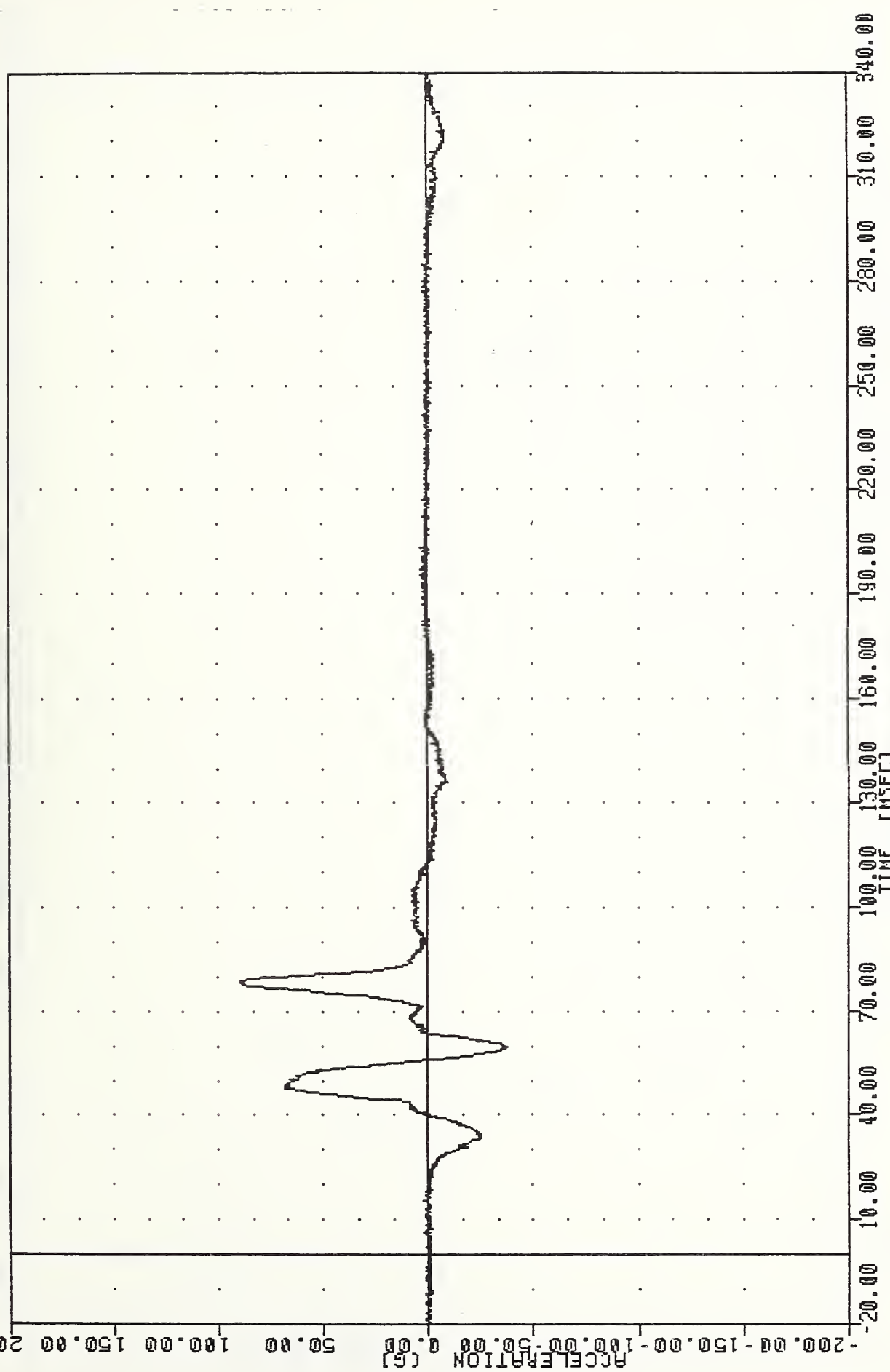
FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -82.09 78.88 13.88 312.63



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER HEAD ACCELERATION X AXIS

VRT . . 850130  
 SI PROTECTION PROD VEH  
 851200000000  
 HEDYG1  
 PLOT DATE 9-MAY-85 10:28:49  
 FILTER = ALPF 1650/ 5217/ -40  
 MIN, MAX VALUES = -37.630 59.63, 89.62 0 78.13

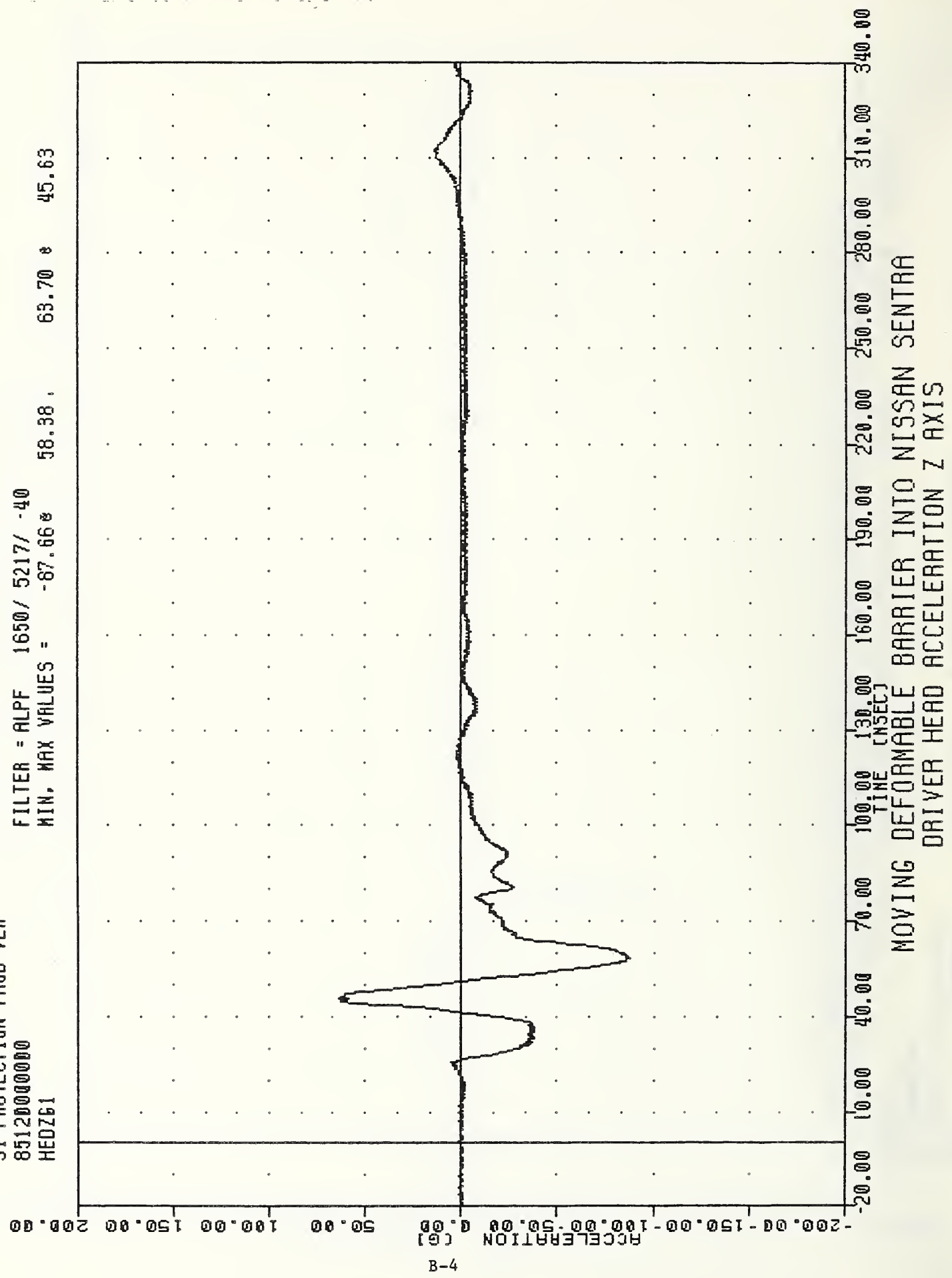


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER HEAD ACCELERATION Y AXIS

VAT , 850430  
SI PROTECTION PROD VEH  
851200000000  
HE0261

PLOT DATE 9-MAY-85 10:28:49

FILTER = ALPF 1650/ 5217/ -40  
MIN, MAX VALUES = -87.66g 63.70g 45.63



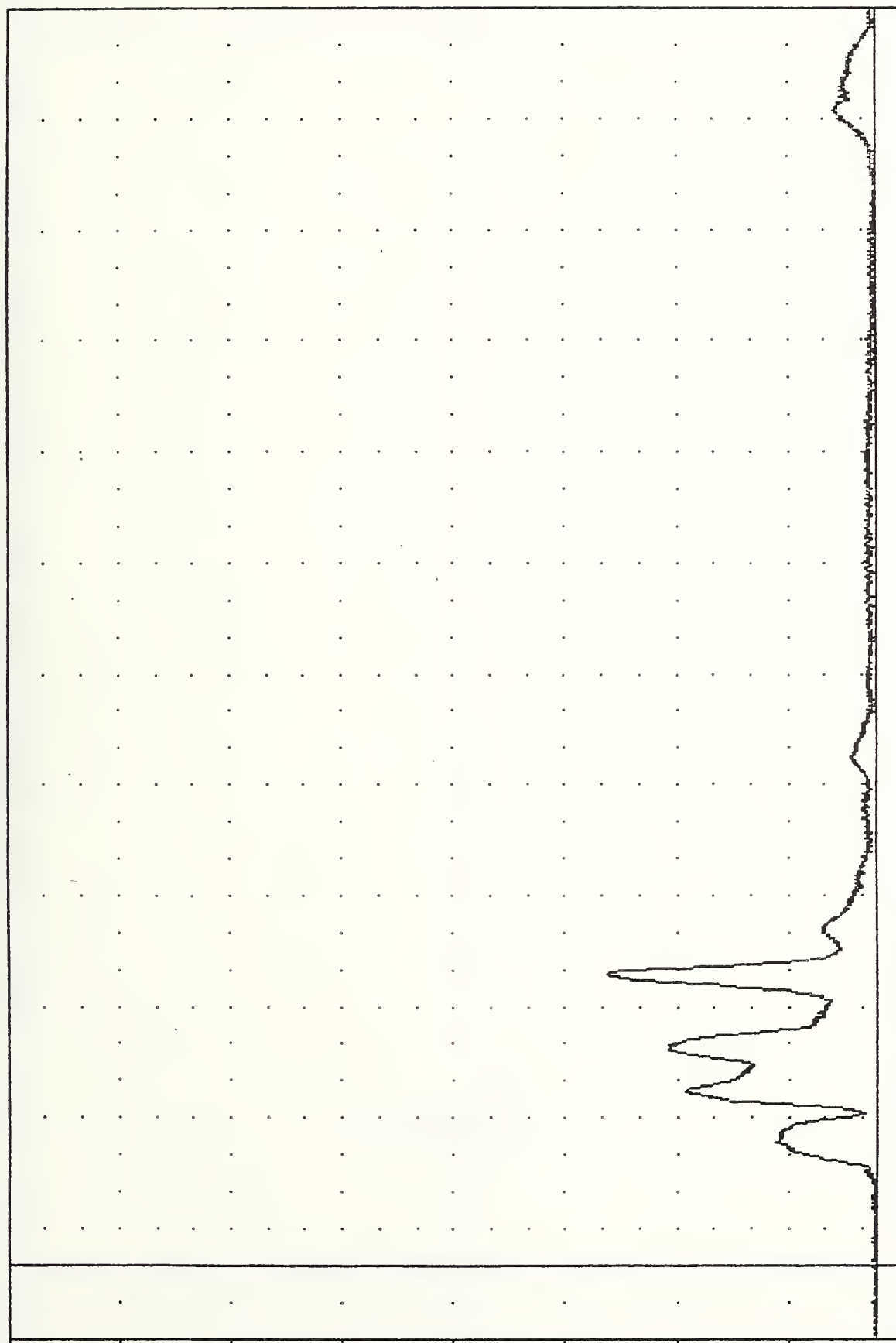
VRT . . , 850430  
SI PROTECTION PROD VEH  
851200000000  
HEORG1

PLOT DATE 9-MAY-85 10:28:49

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = 0.238 291.00, 121.85 & 79.00

ACCELERATION (G)



TIME (MSEC)

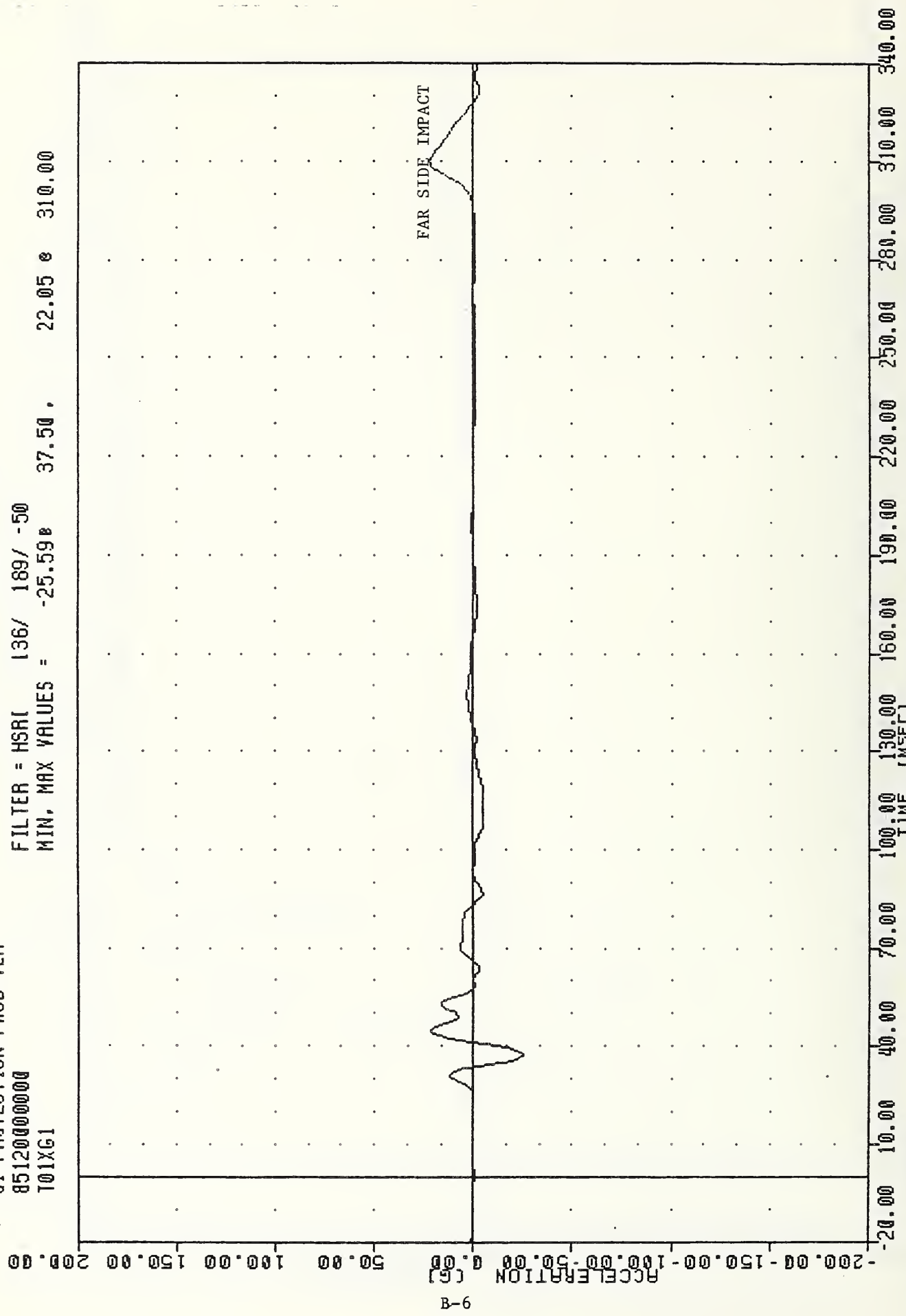
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER HEAD RESULTANT

VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 T01XG1

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

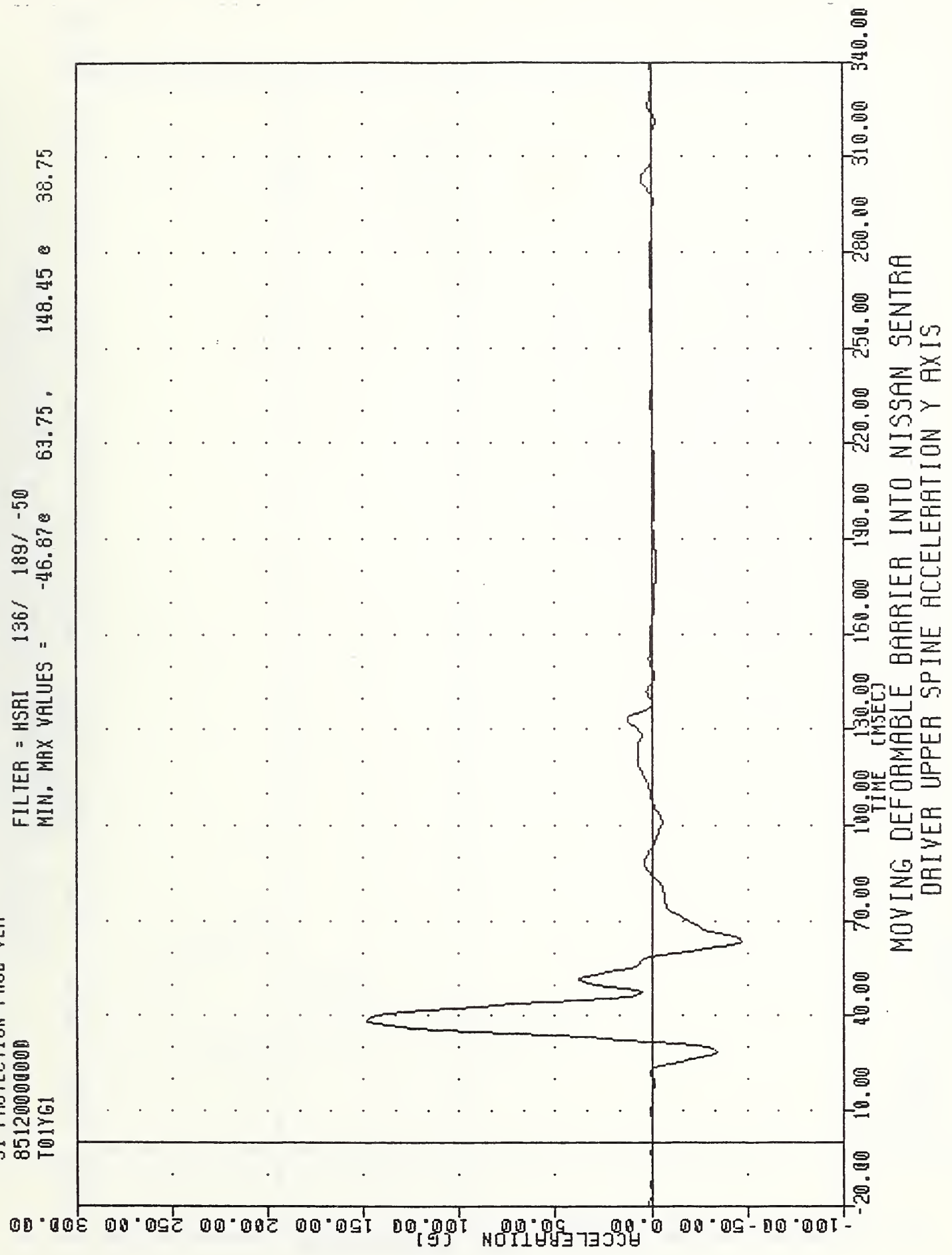
MIN, MAX VALUES = -25.59 37.50 , 22.05 310.00



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER UPPER SPINE ACCELERATION X AXIS

VRT . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 T01Y61

PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -46.87e 63.75, 148.45 e 38.75

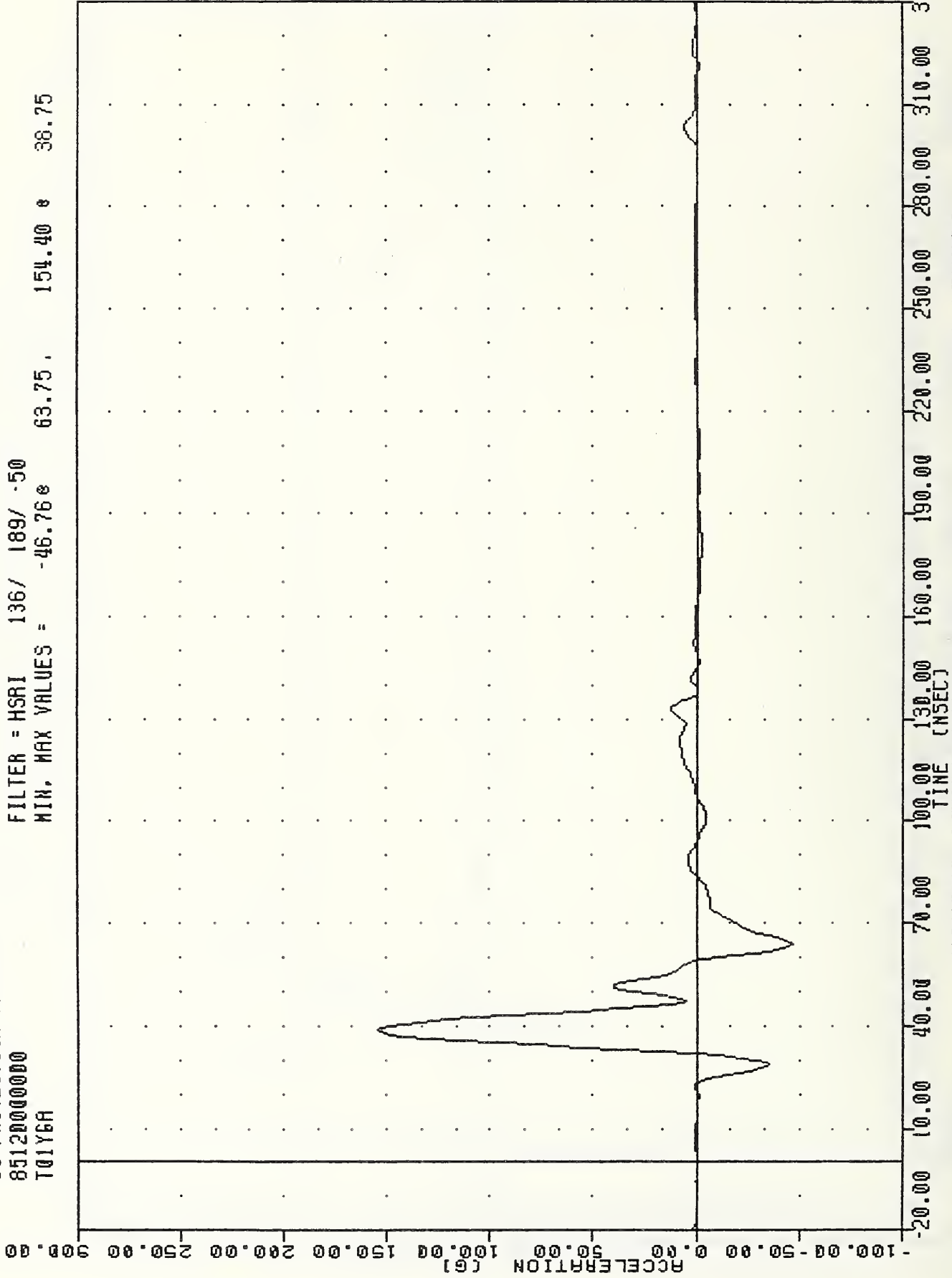


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER UPPER SPINE ACCELERATION Y AXIS

PLT DATE 9-MAY-85 10:25:49

VAT , 850430  
SI PROTECTION PROD VEH  
85120000000  
T01Y6A

FILTER = HSRI 136/ 189/ -50  
MIN, MAX VALUES = -46.76 63.75 , 154.40 \* 38.75

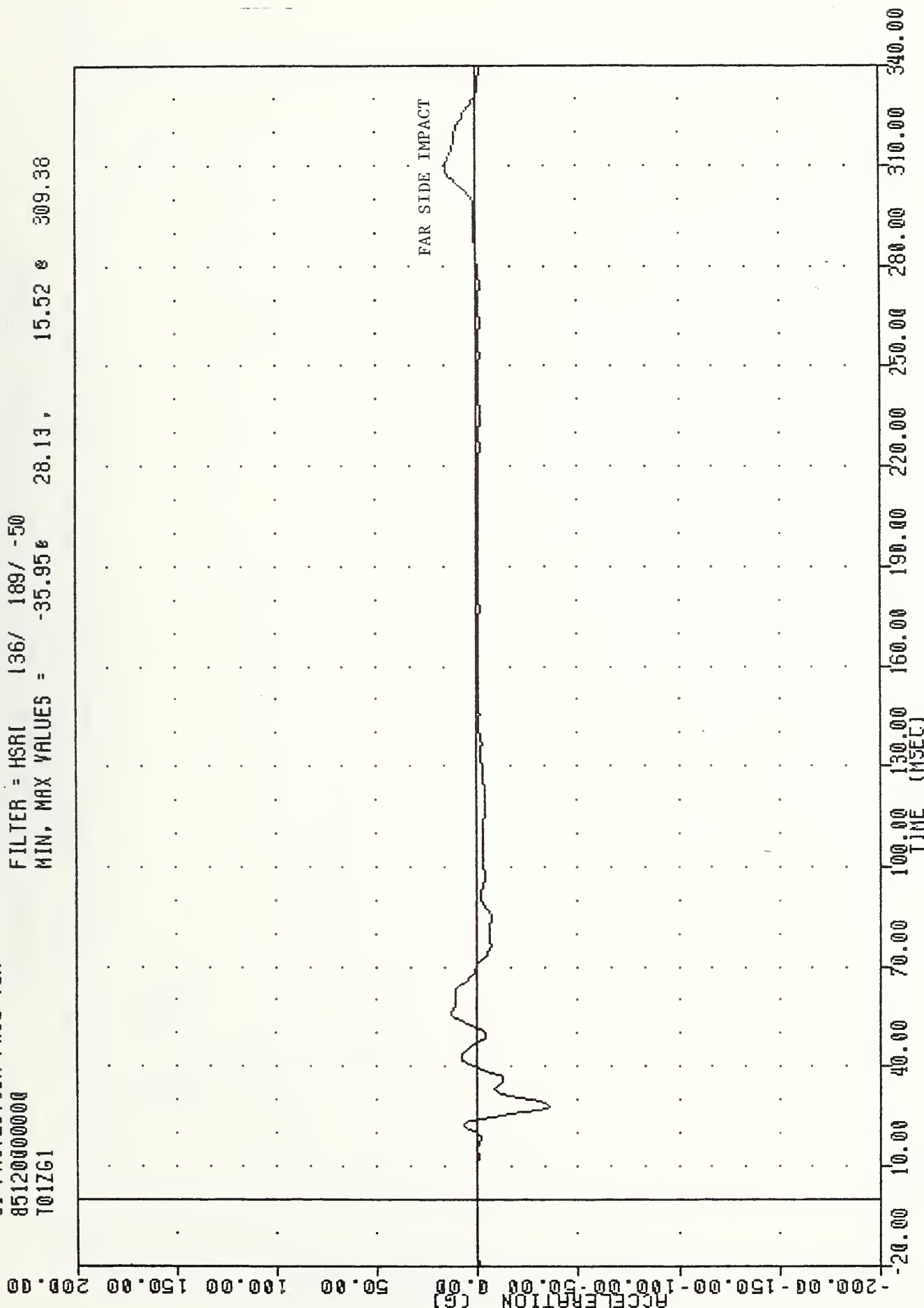


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER UPPER SPINE ACCELERATION -2 Y AXIS

PLOT DATE 9-MAY-85 10:25:49

VRT ., 850430  
SI PROTECTION PROD VEH  
85120000000  
T01ZG1

FILTER = HSRI 136/ 189/ -50  
MIN, MAX VALUES = -35.95 28.13, 15.52 309.38



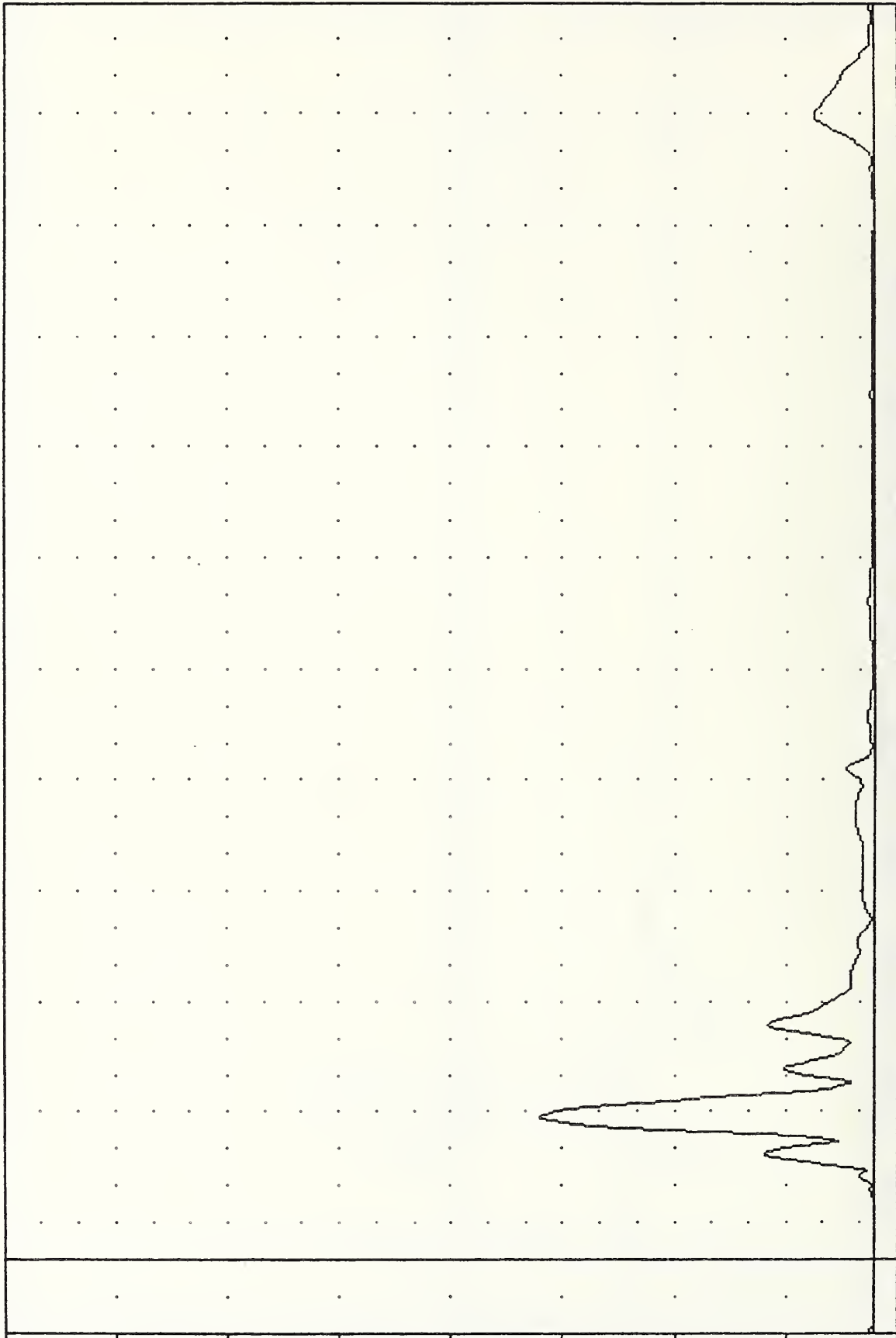
VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
T01RG1

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.09e -4.38 , 149.98 e 38.75

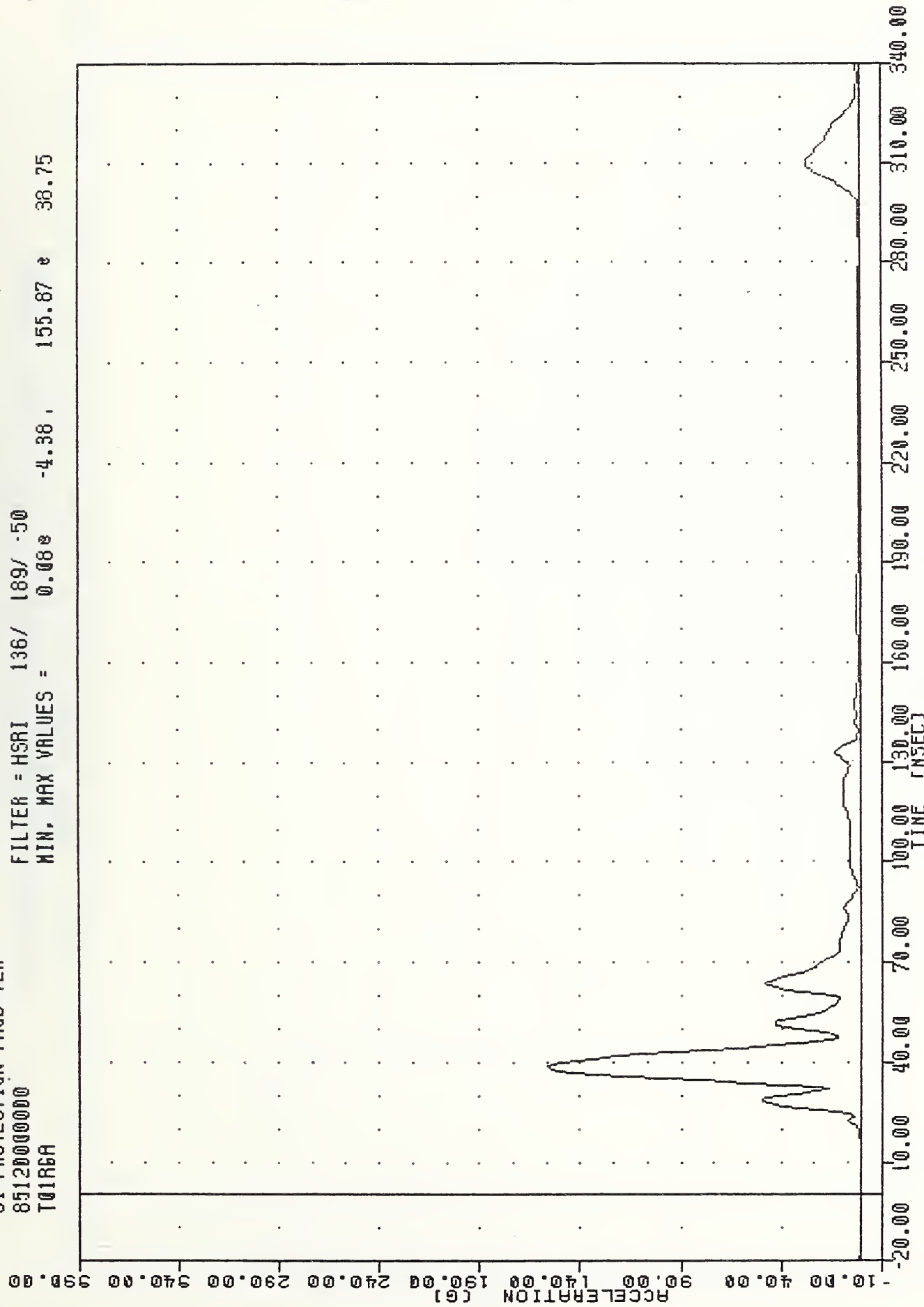
ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER UPPER SPINE RESULTANT

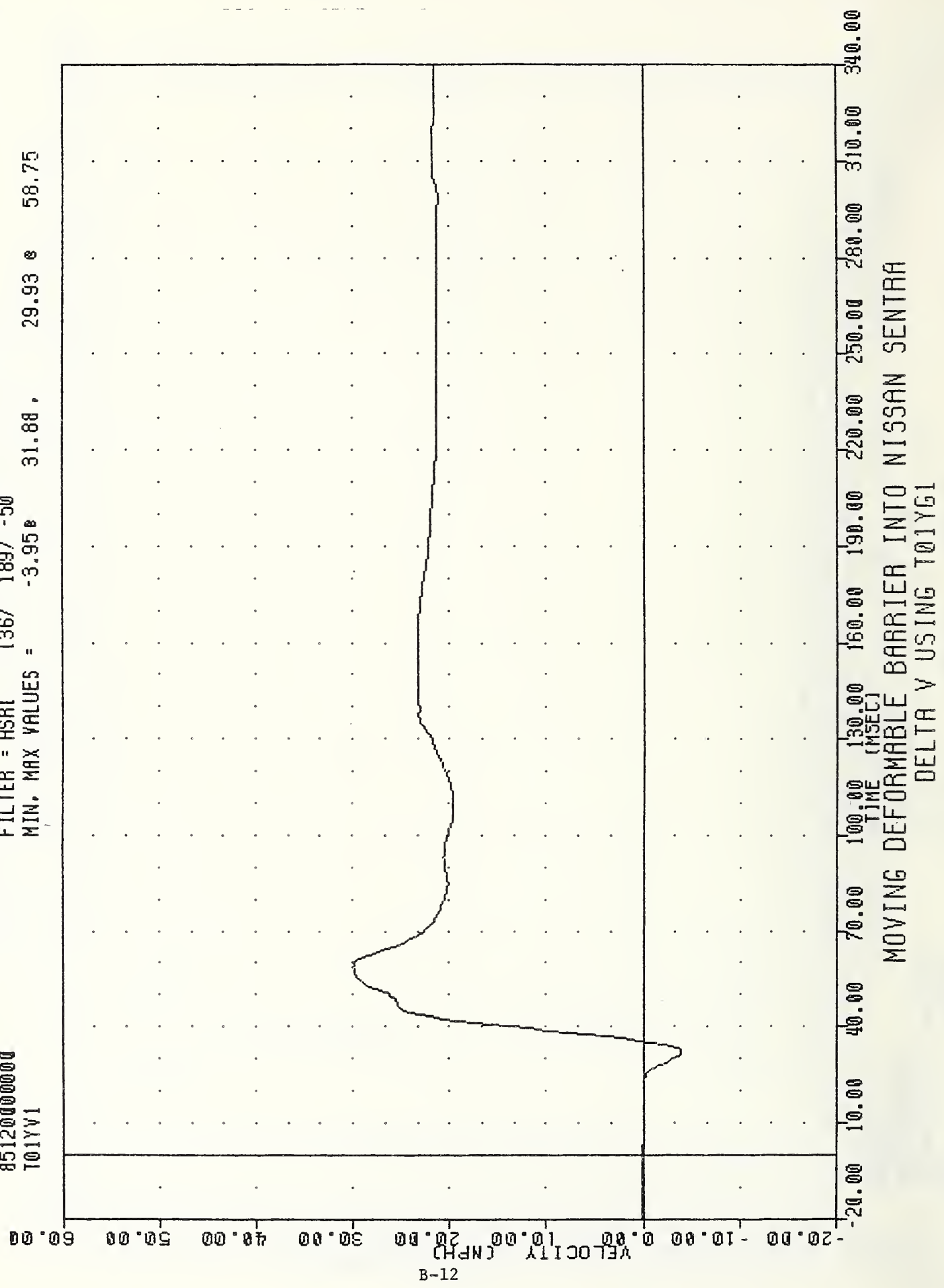
VRT ., 850430  
 SI PROTECTION PROD YEH  
 851200000000  
 T01R6A  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = 0.08e -4.38, 155.87 e 38.75



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER UPPER SPINE RESULTANT USING T01YGA

VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 T01YV1

PLOT DATE 9-MAY-85 10:27:48  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -3.95 31.88 29.93 58.75

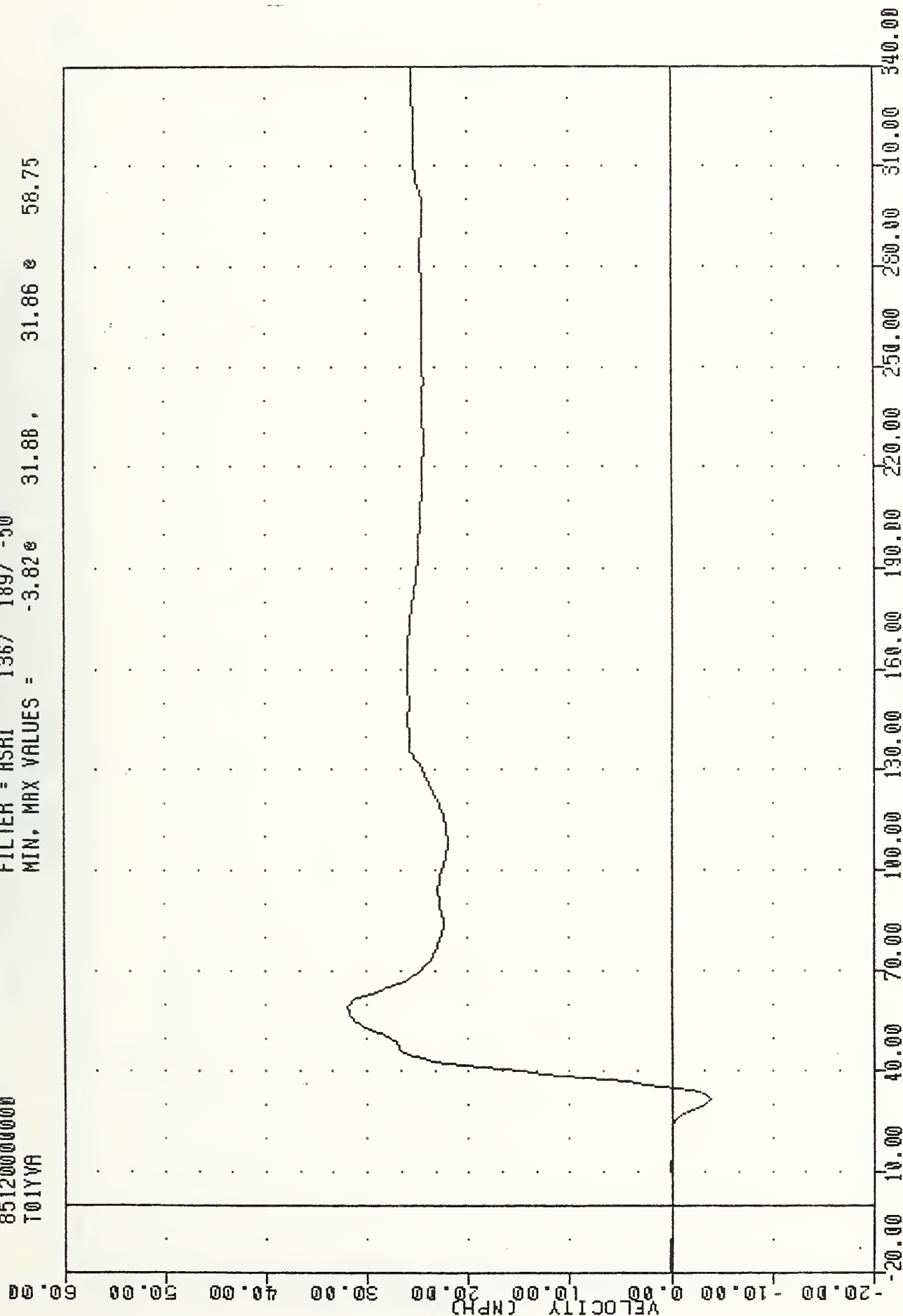


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING T01YV1

VRT  
SI PROTECTION PROD VEH  
851200000000  
T01YVA

PLOT DATE 9-MAY-85 10:27:48

FILTER = HSRI 136/ 189/ -50  
MIN. MAX VALUES = -3.82 31.86 58.75



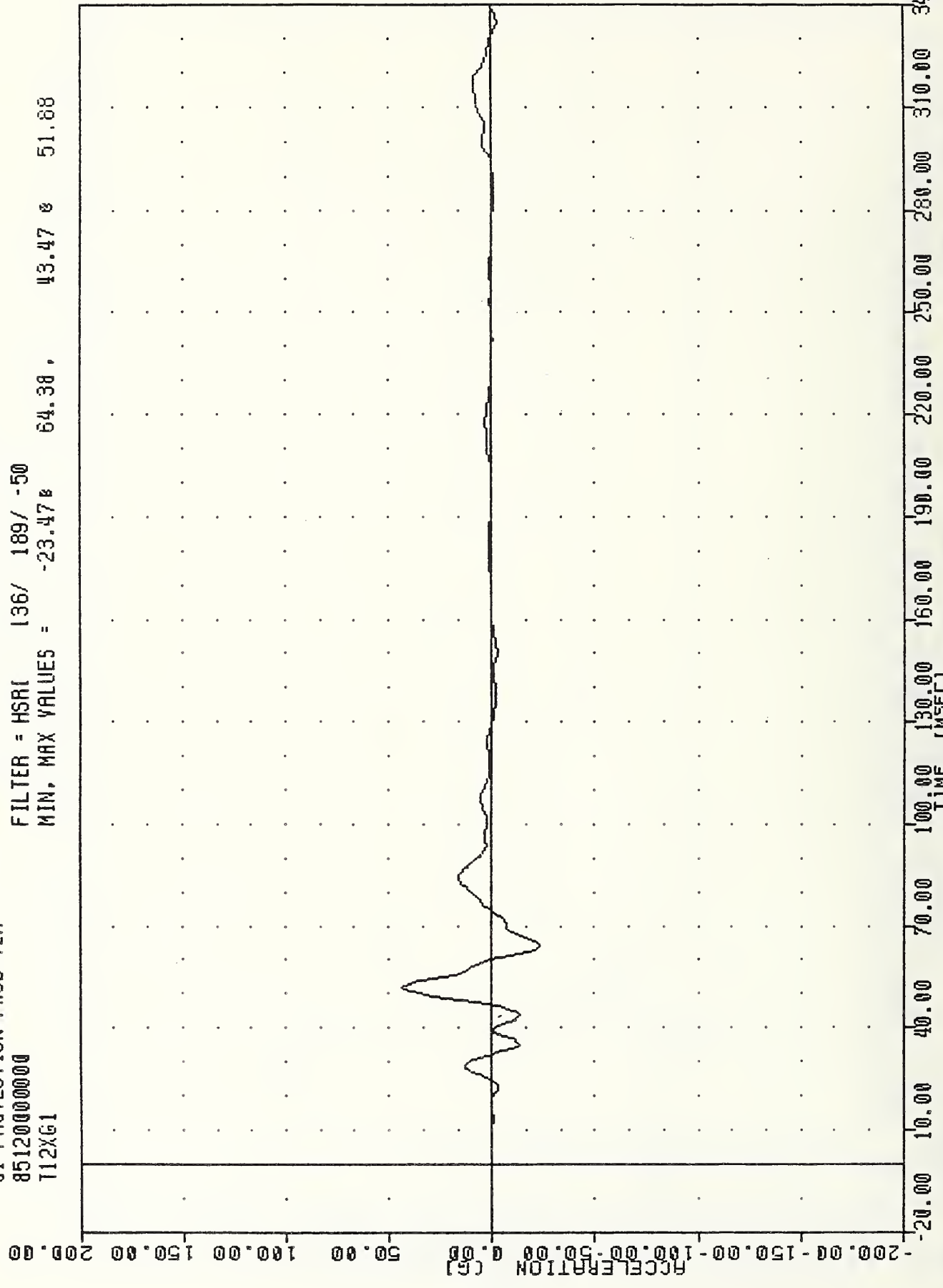
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING T01YGA

PLOT DATE 9-MAY-85 10:25:49

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
T12XG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -23.47 64.38 43.47 51.88



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER LOWER SPINE ACCELERATION X AXIS

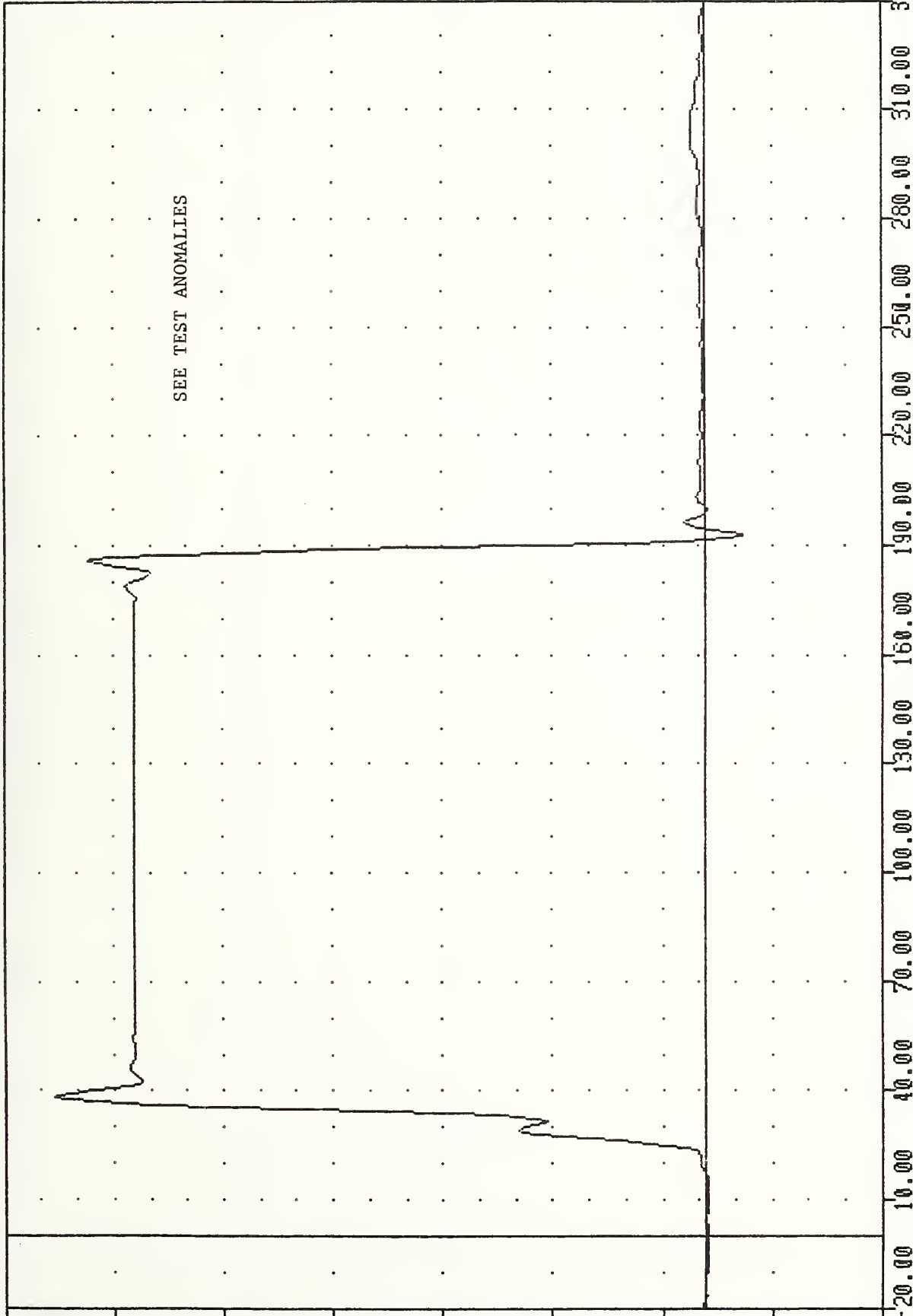
VRT . . , 850430  
SI PROTECTION PROD VEH  
851200000000  
T12YG1

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

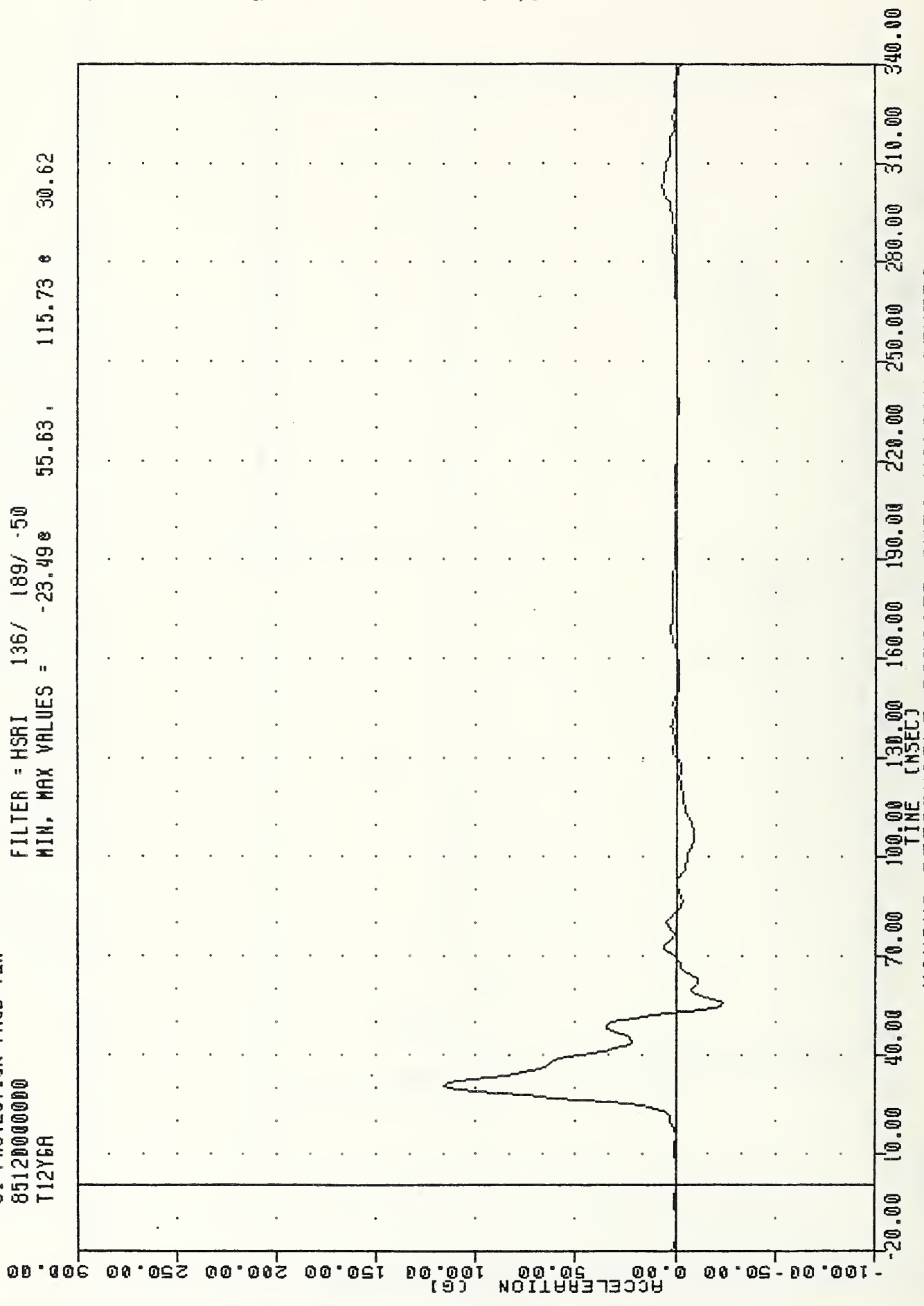
MIN. MAX VALUES = -21.32 192.50 , 372.27 38.13

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER LOWER SPINE ACCELERATION Y AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 T12Y6A  
 PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSRI 136/ 189/ -50  
 MIN, MAX VALUES = -23.49e 55.63 , 115.73 e 30.62



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER LOWER SPINE ACCELERATION -2 Y AXIS

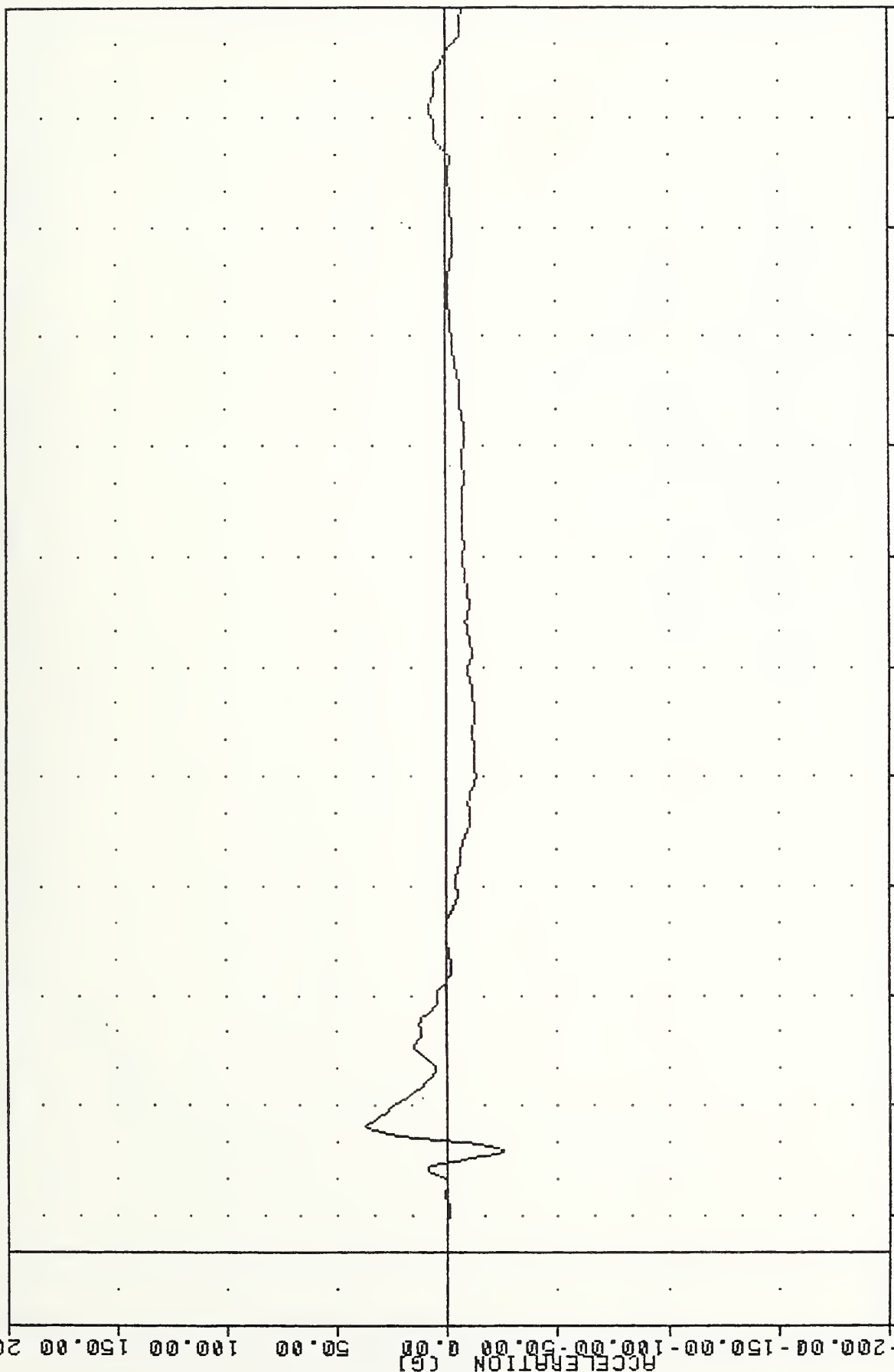
VRT . . , 850430  
SI PROTECTION PROD VEH  
851200000000  
T12ZG1

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -25.48 27.50 36.93 34.38

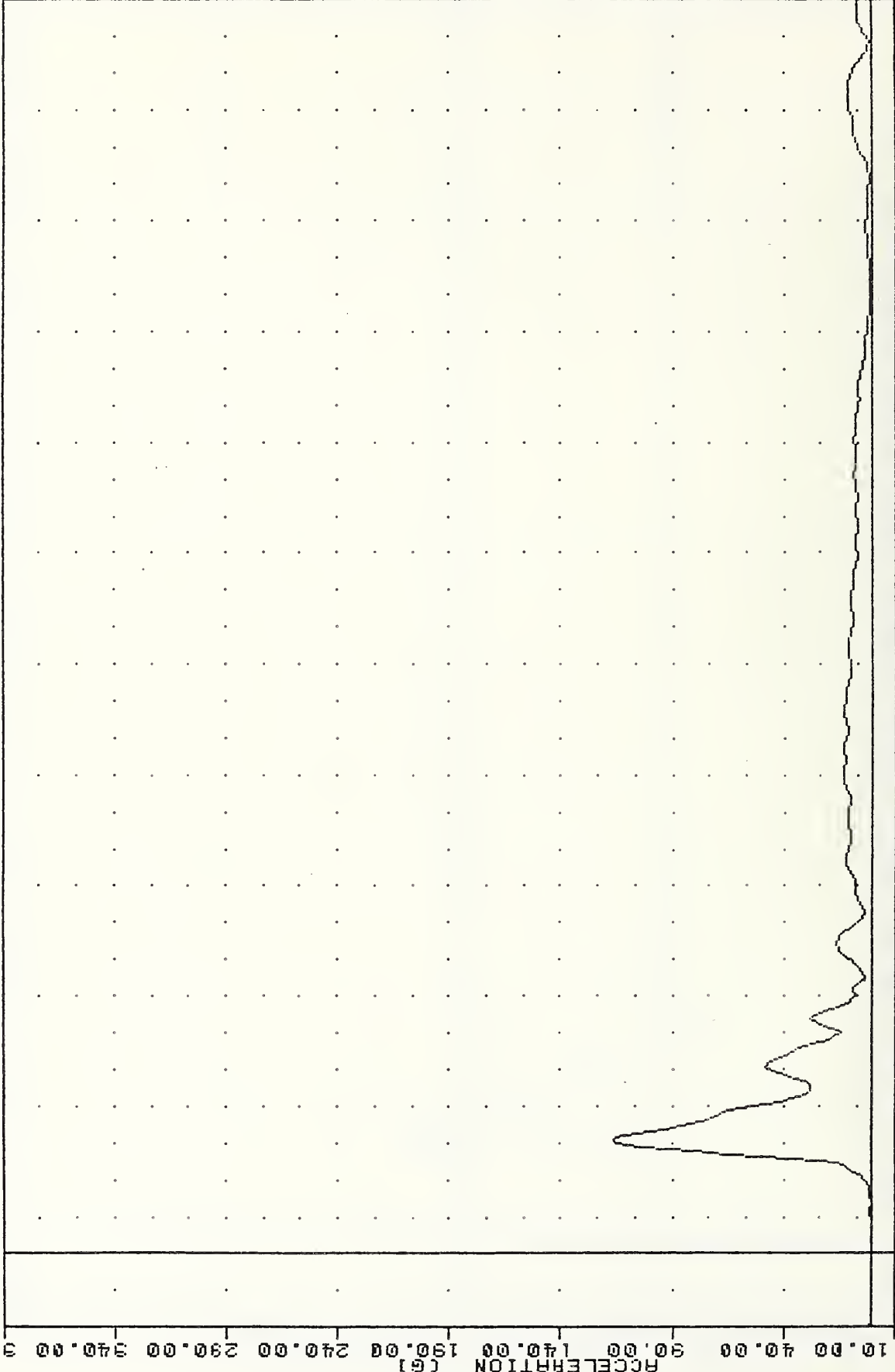
200.00



-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER LOWER SPINE ACCELERATION Z AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 T12RGA  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = 0.090 -7.50 , 116.11 30.62  
 9-MAY-85 10:25:49



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER LOWER SPINE RESULTANT USING T12YGA

VRT . , 850430  
SI PROTECTION PROD VEH  
85120000000  
T12YVA

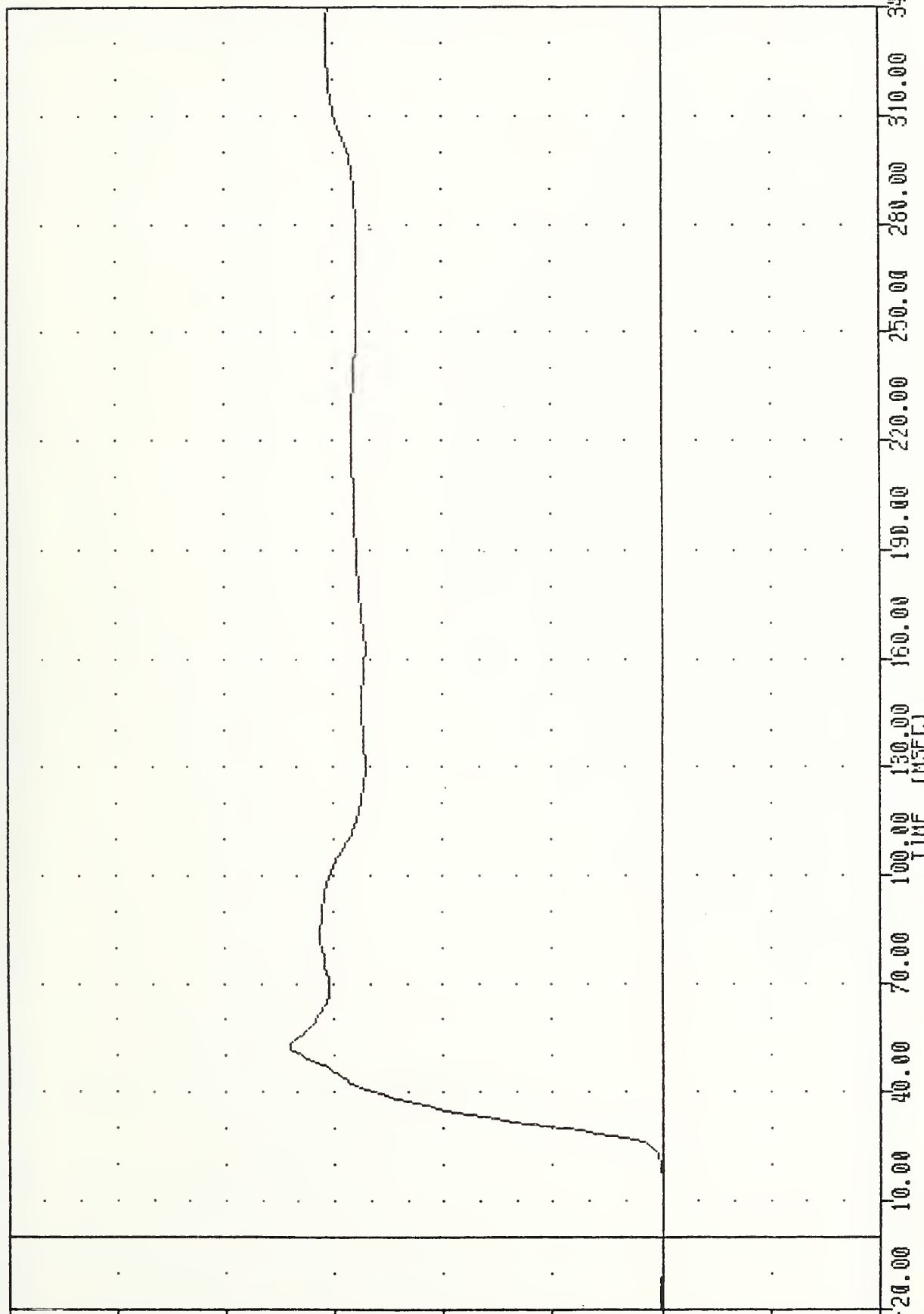
PLOT DATE 9-MAY-85 10:27:48

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.03e 8.13, 34.06 e 52.50

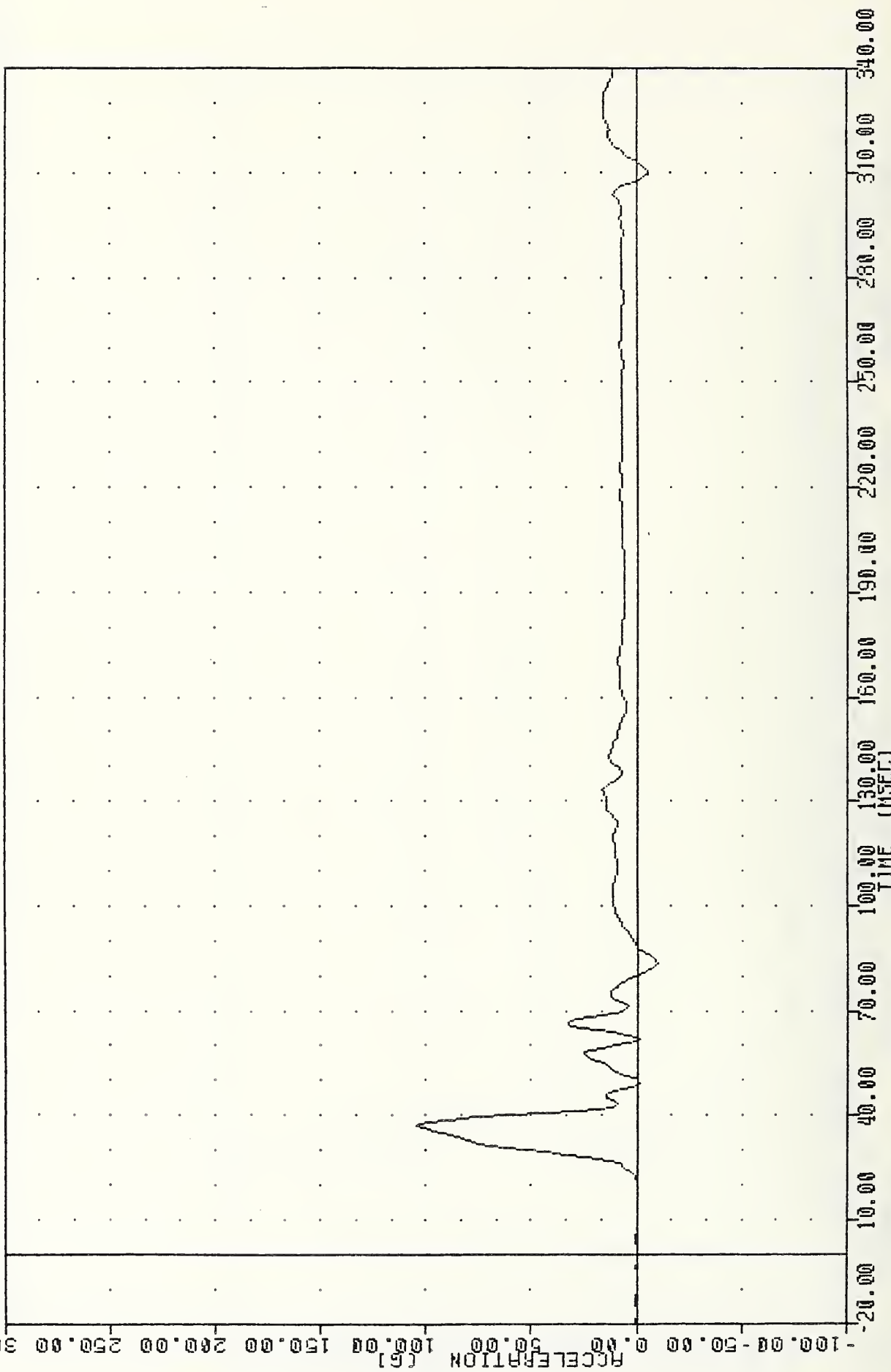
VELOCITY (MPH)

B-19



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING T12YGA

VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 LURY61  
 PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -9.75e 83.75, 104.32 e 36.88



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

VRT . . 850430  
SI PROTECTION PROD VEH  
851200000000  
LURYV1

PLOT DATE 9-MAY-85 10:27:48

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.10e 21.88, 75.89 e 340.00

60.00

50.00

40.00

30.00

20.00

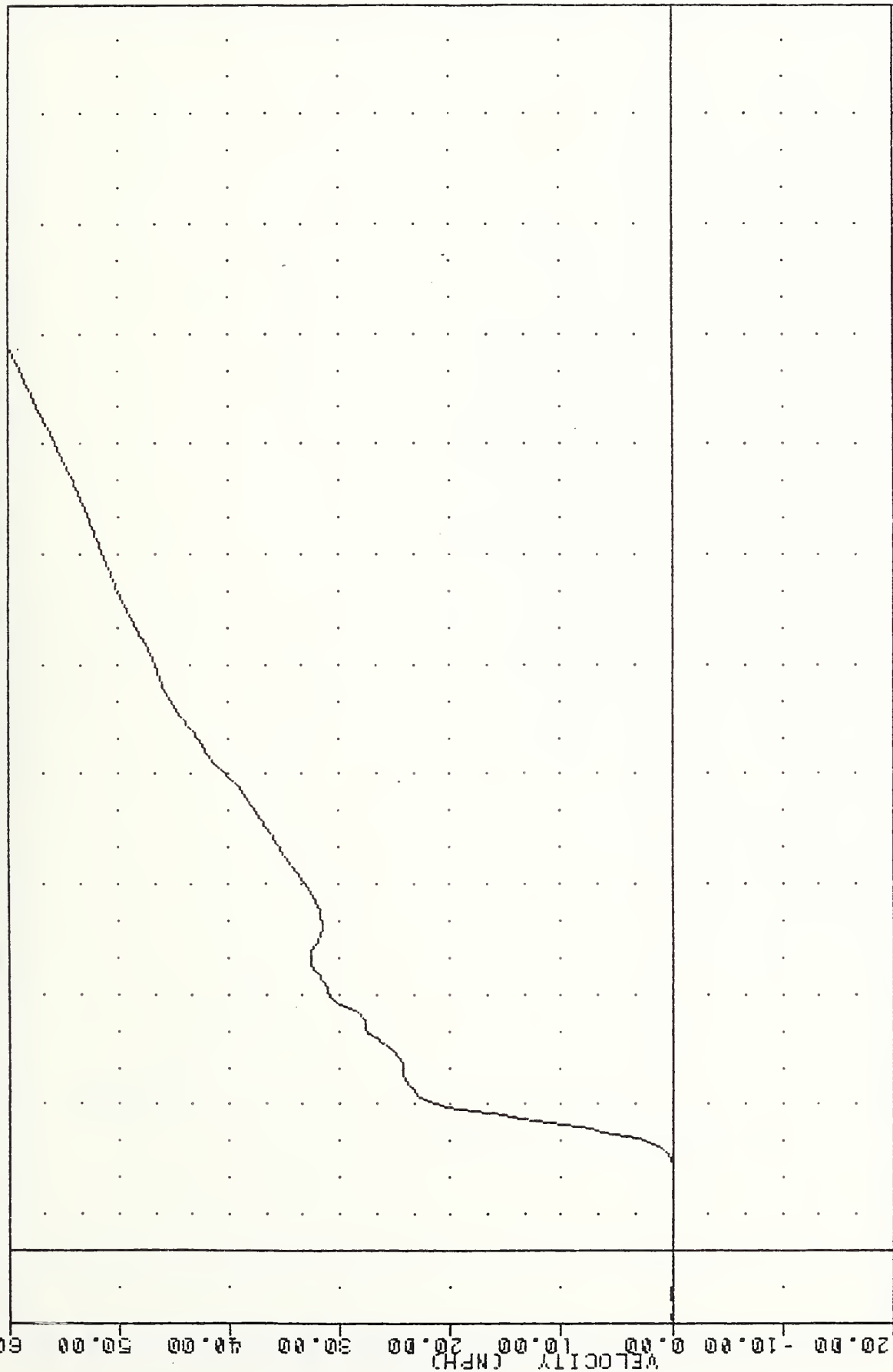
10.00

0.00

-10.00

-20.00

B-21



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

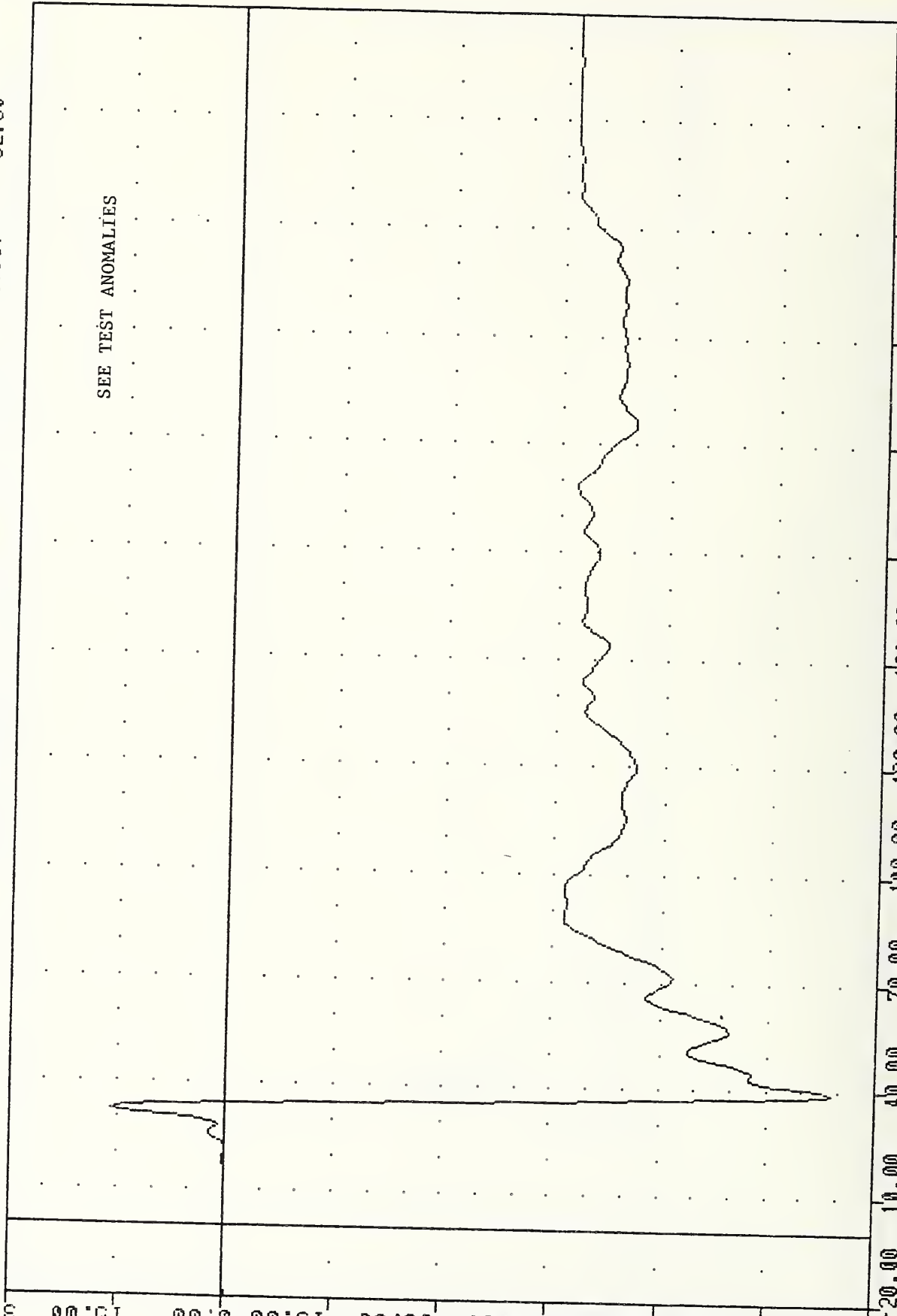
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING LURYG1

VRT , 850430  
SI PROTECTION PROD VEH  
85120000000  
LURYGA

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50  
MIN. MAX VALUES = -840.45 39.38 , 157.97 32.50

ACCELERATION (G) (X10<sup>4</sup>)



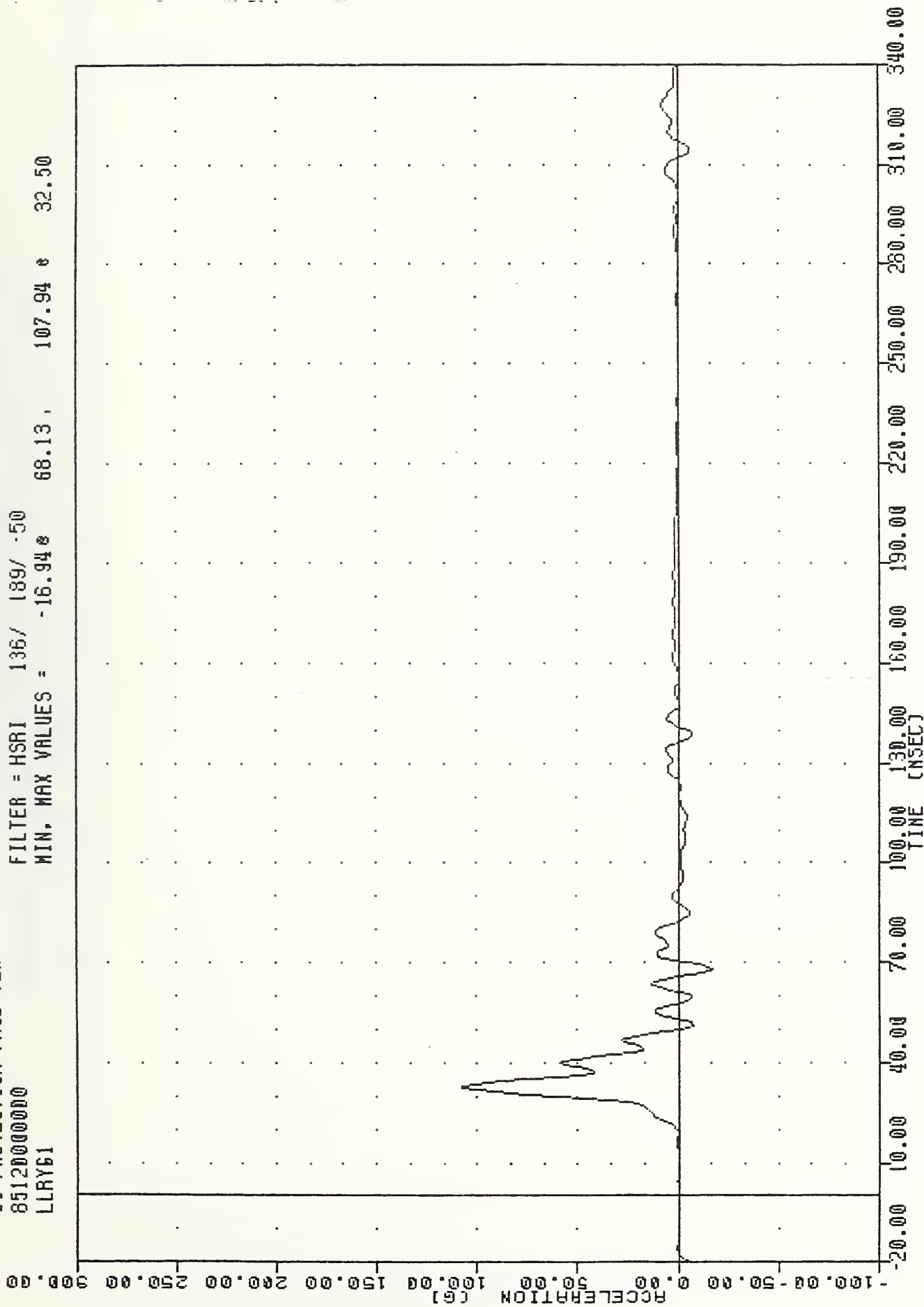
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER LEFT UPPER RIB ACCELERATION -2 Y AXIS

VAT . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 L1RY61

FILTER = HSRI 136/ 139/ -50  
 MIN. MAX VALUES = -16.94 68.13, 107.94 32.50

PLOT DATE 9-MAY-85 10:25:49



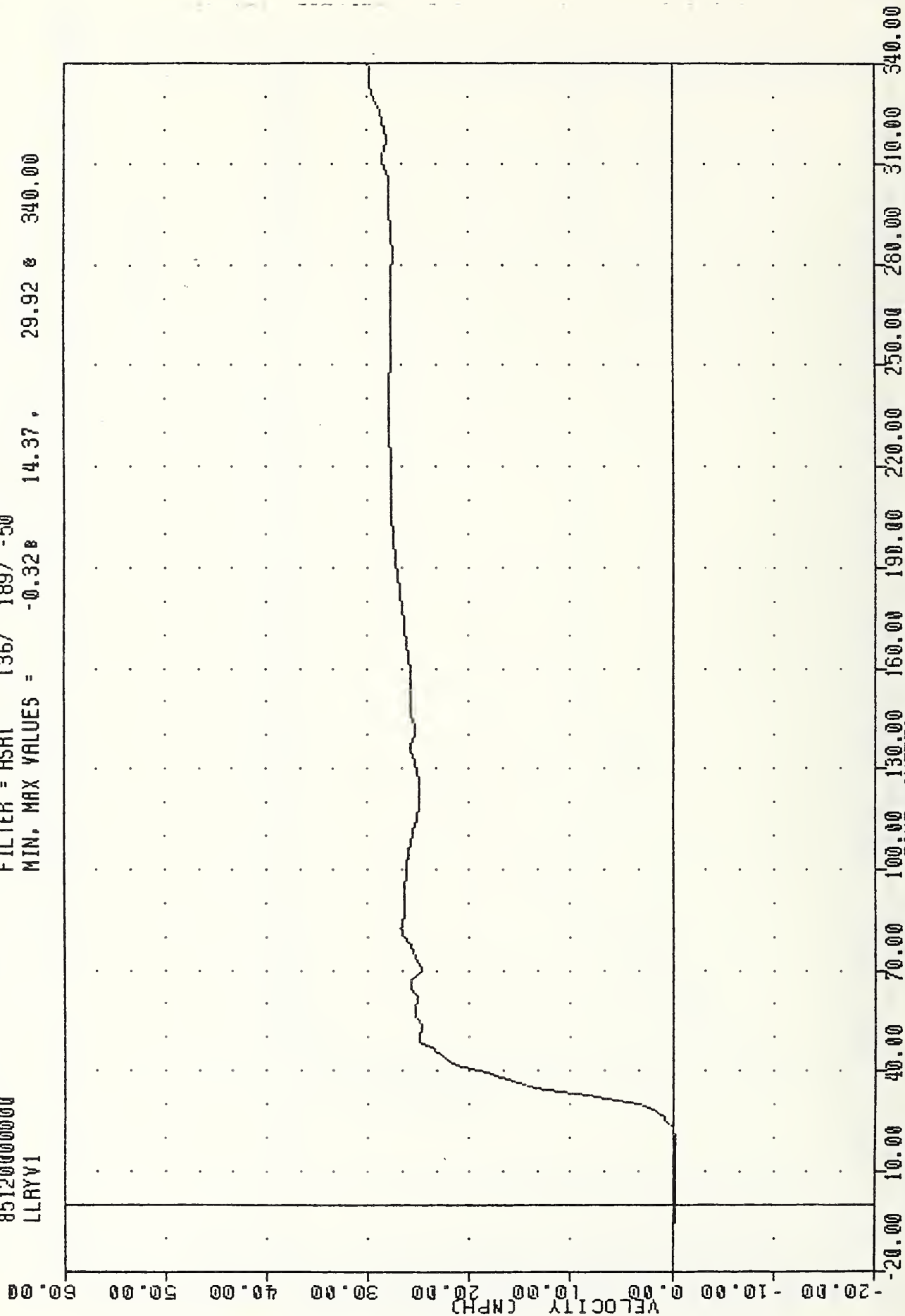
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LLRYV1

PLOT DATE 9-MAY-85 10:27:43

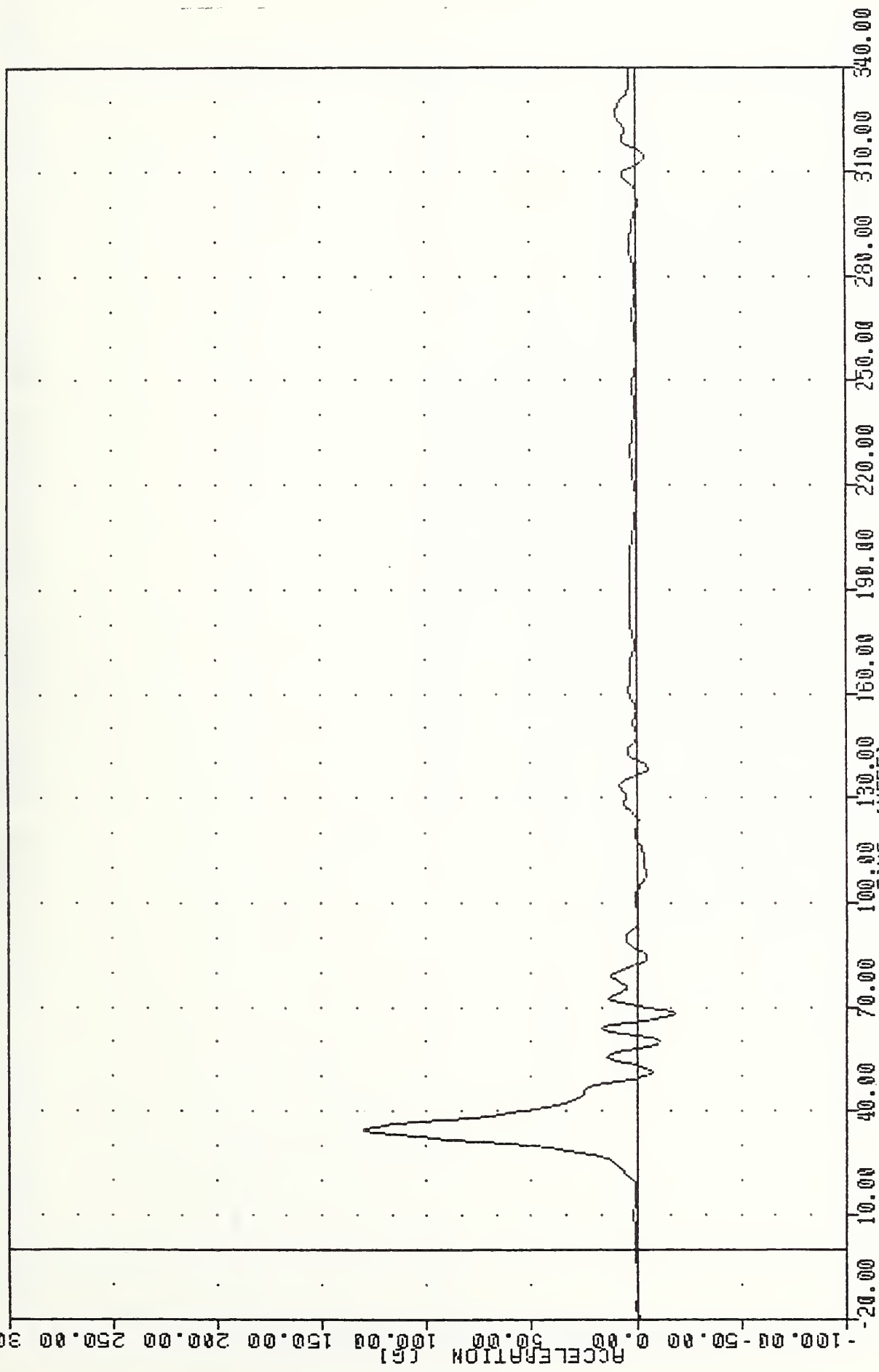
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.32 14.37 29.92 340.00



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING LLRYG1

VRT . . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LLRYGA  
 FILTER = HSRI 136/ 189/ -50  
 MIN, MAX VALUES = -18.90 68.13 129.79 34.36  
 PLOT DATE 9-MAY-85 10:25:49

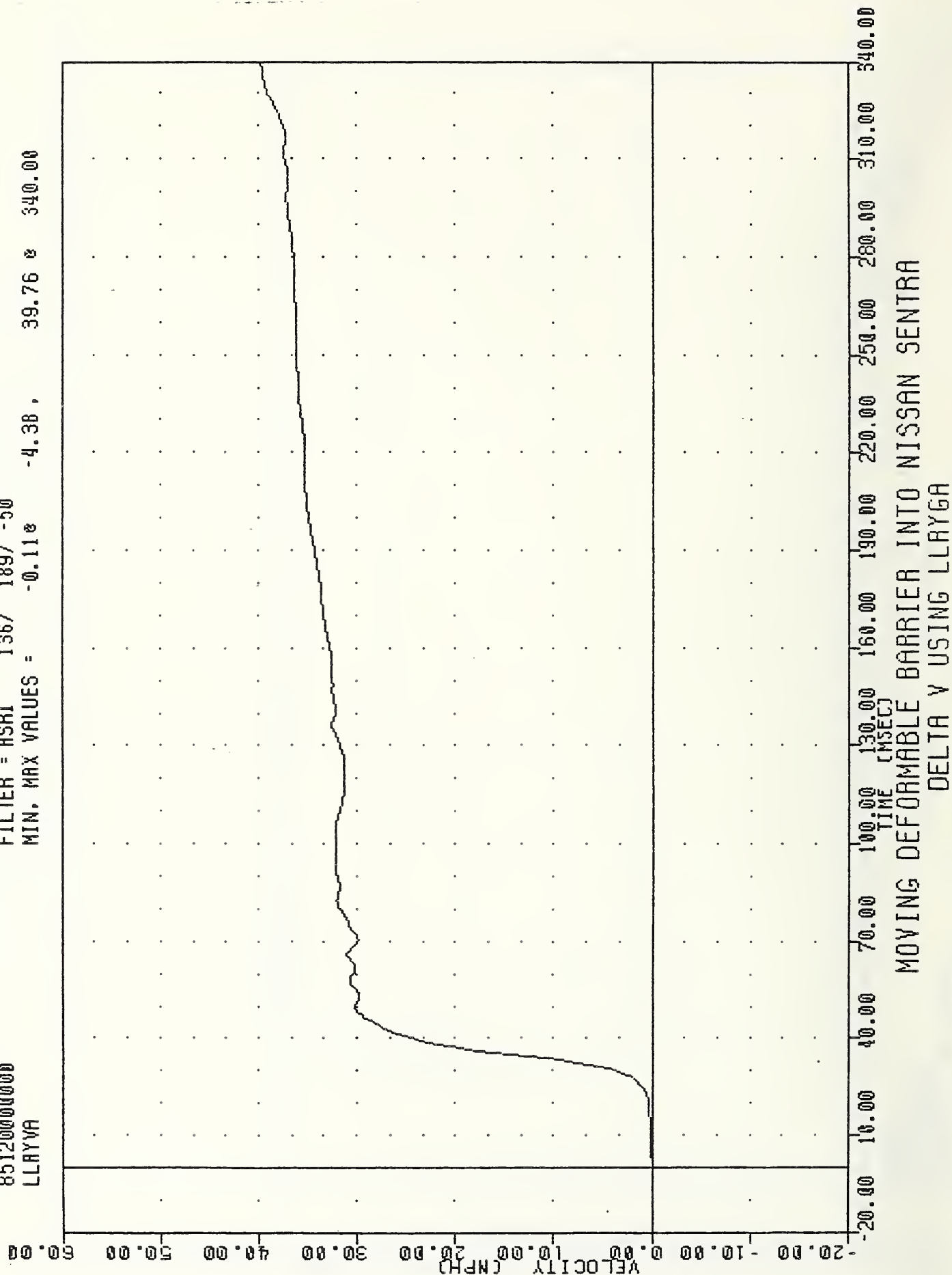


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER LEFT LOWER RIB ACCELERATION #2 Y AXIS

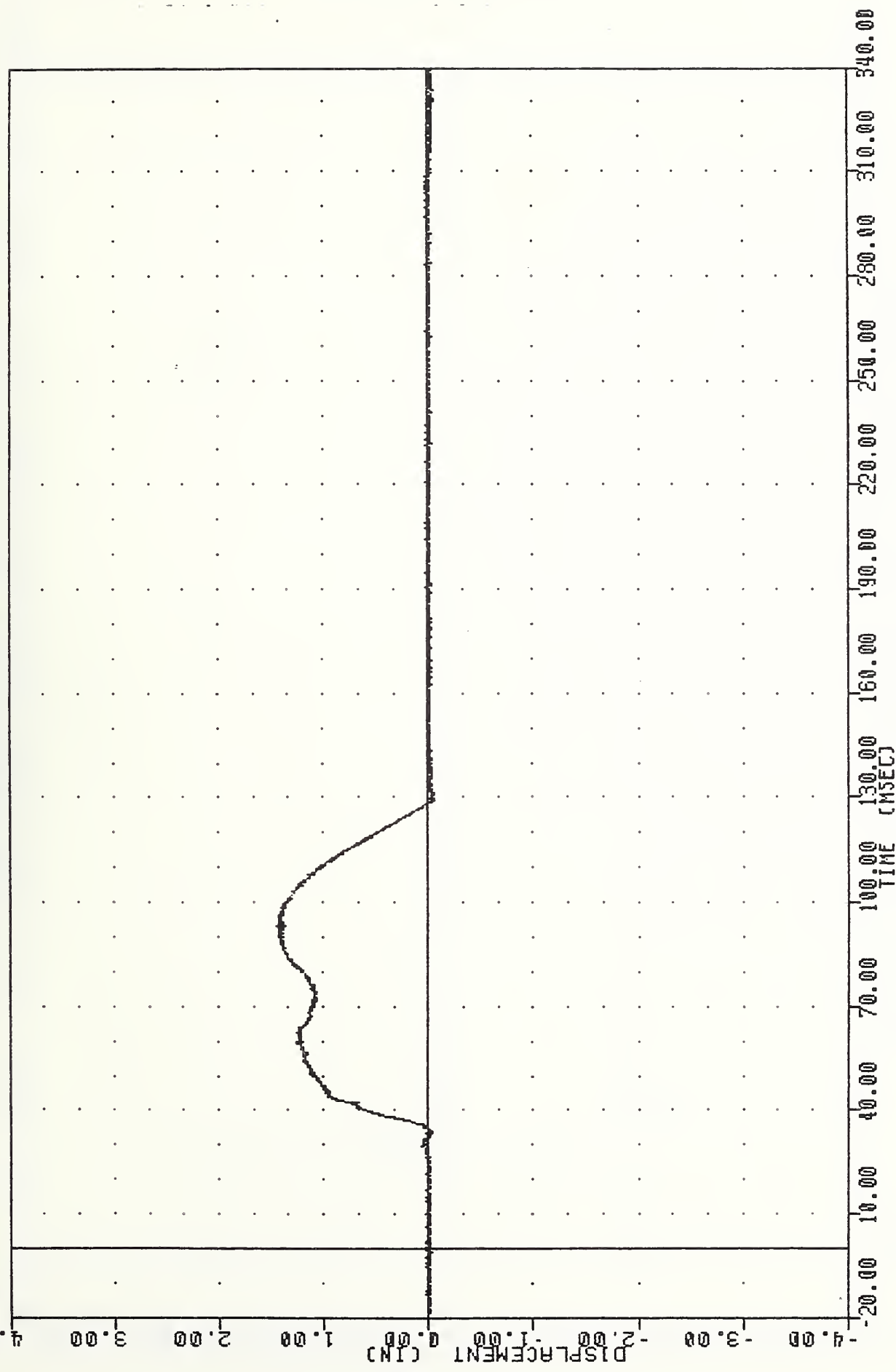
PLOT DATE 9-MAY-85 10:27:48

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
LLAYVA

FILTER = HSRI 136/ 189/ -50  
MIN, MAX VALUES = -0.110 -4.38 , 39.76 & 340.00



VRT . . , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LRTYD1  
 FILTER = ALPF 1650/ 5217/ -40  
 MIN, MAX VALUES = -0.068 330.75, 1.45 93.13



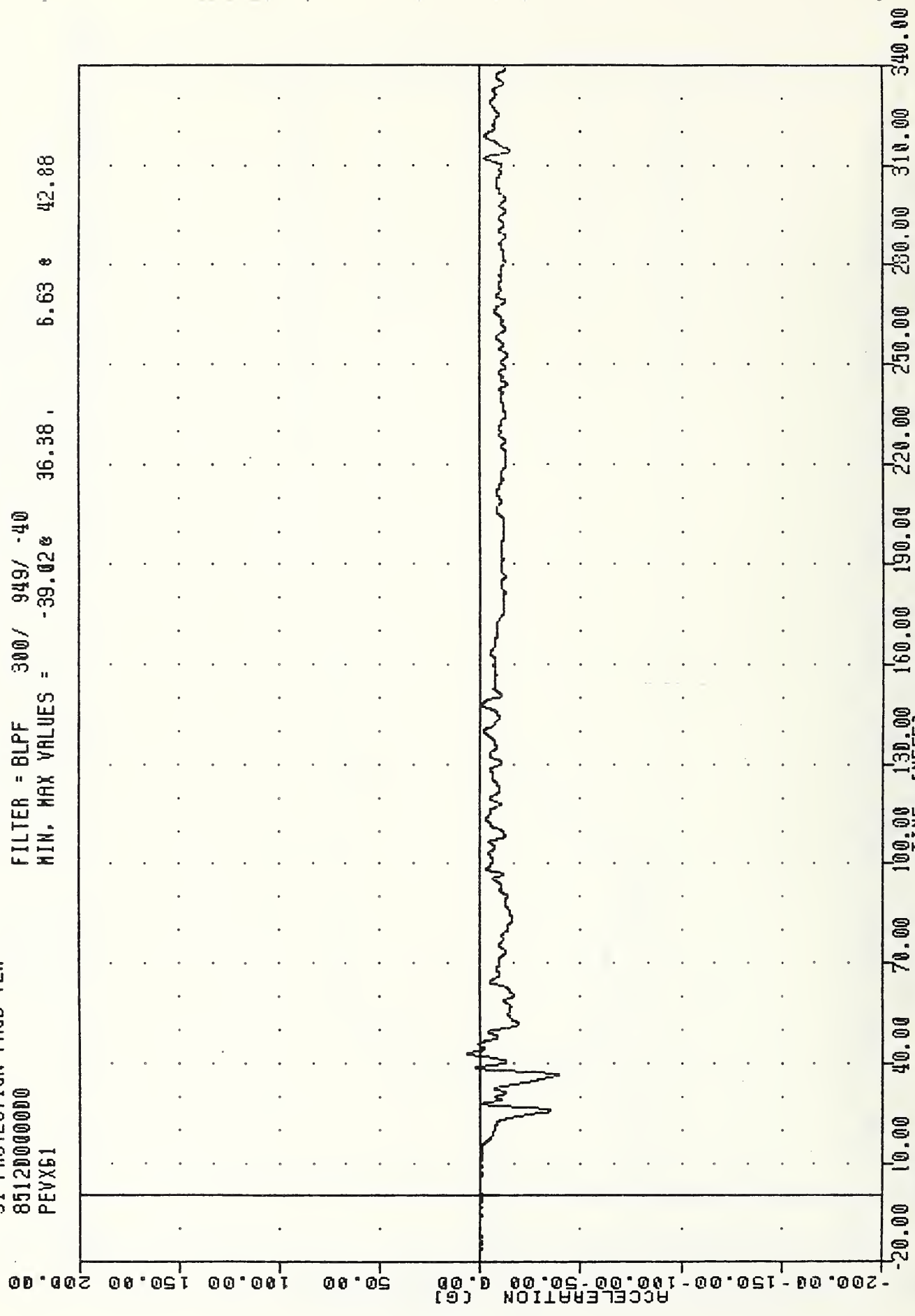
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

VRT , 850430  
SI PROTECTION PROD YEH  
851200000000  
PEVX61

PLOT DATE 9-MAY-85 10:28:49

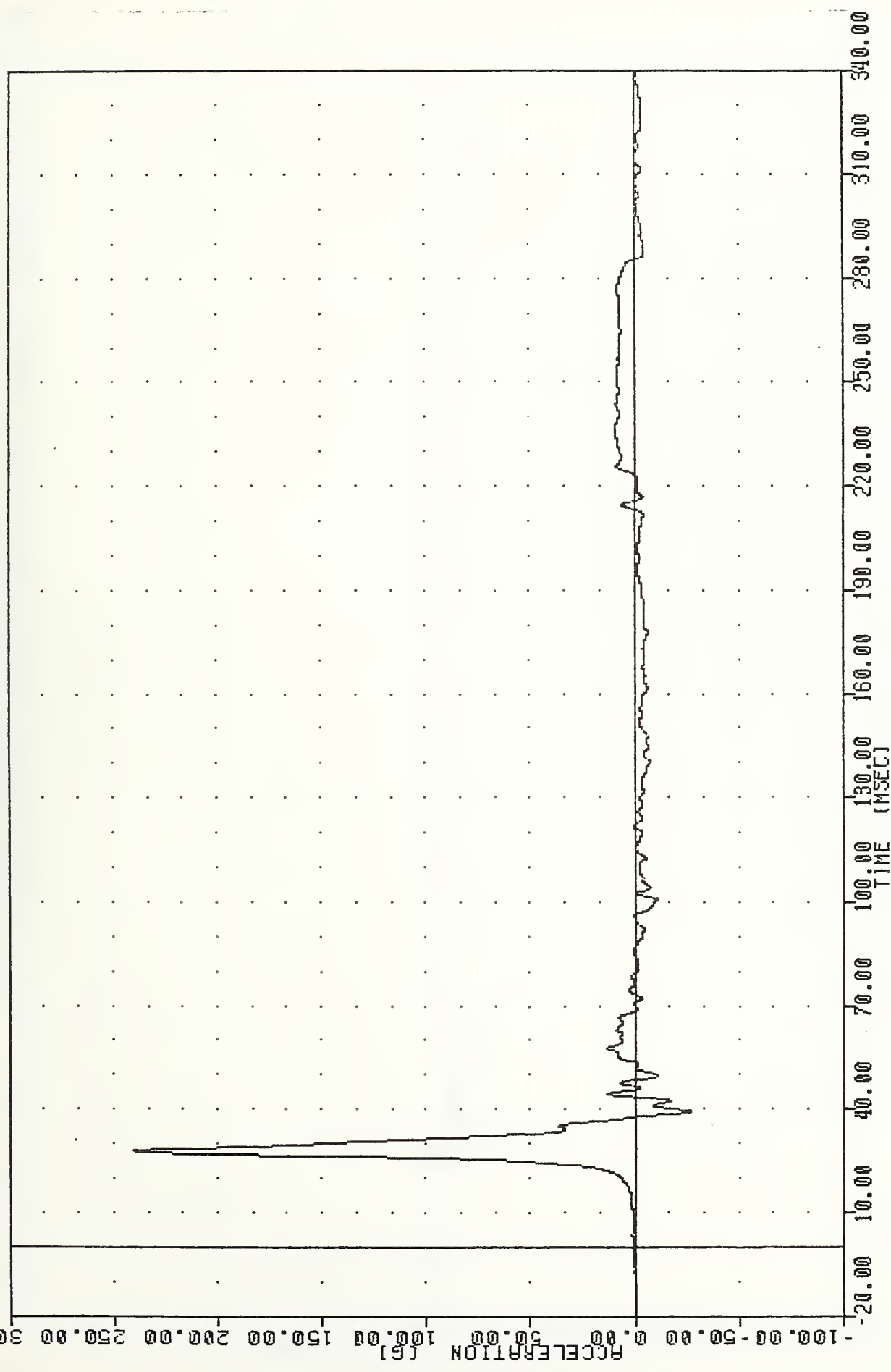
FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -39.02 36.38 , 6.63 42.88



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER PELVIS ACCELERATION X AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 PEVYG1  
 PLOT DATE 9-MAY-85 10:28:49  
 FILTER = BLPF 300/ 949/ -40  
 MIN. MAX VALUES = -27.25 39.25 239.91 27.75

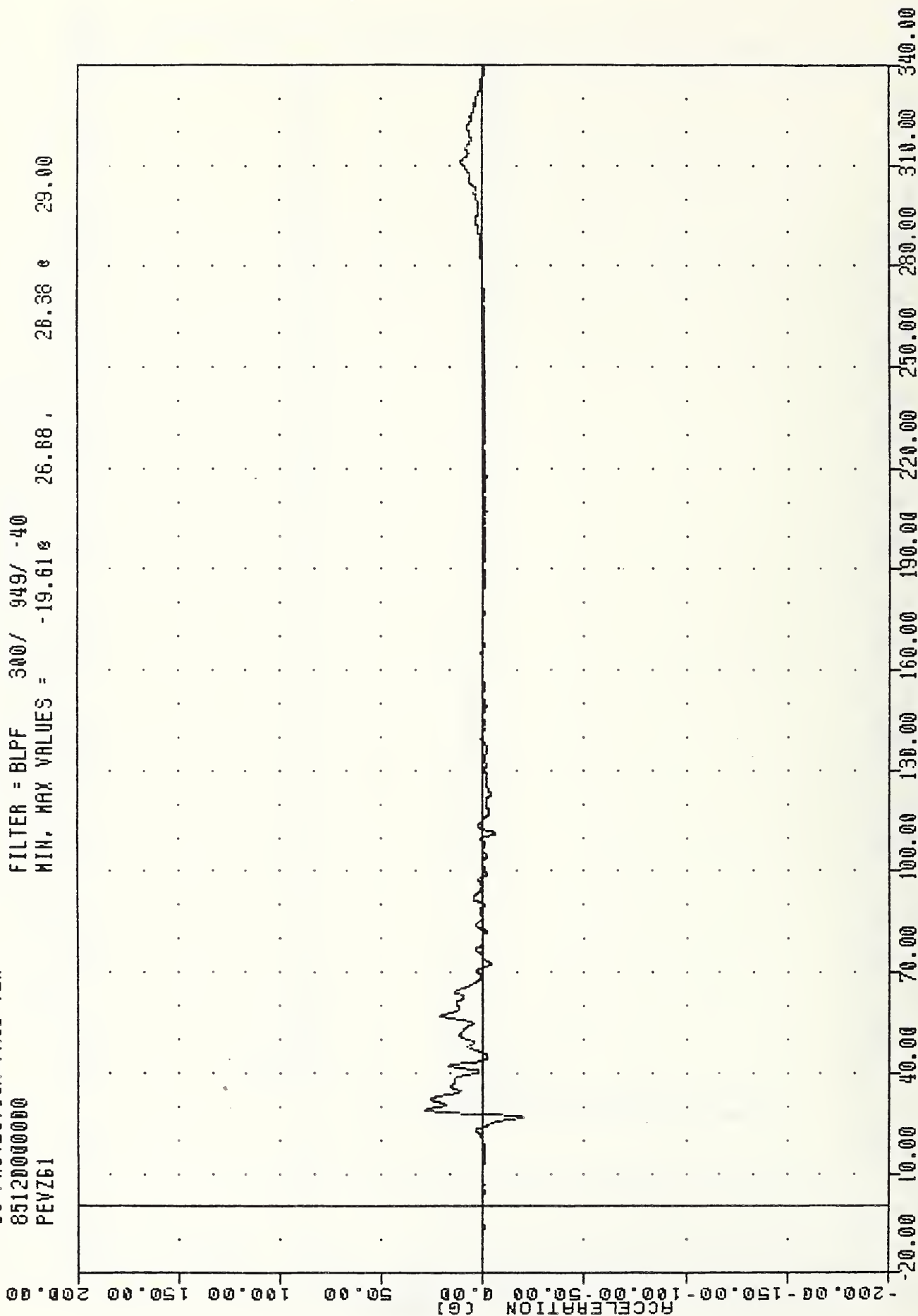


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DRIVER PELVIS ACCELERATION Y AXIS

PLOT DATE 9-MAY-85 10:28:49

VAT , 850430  
SI PROTECTION PRAD VEH  
851200000000  
PEVZ61

FILTER = BLPF 300/ 949/ -40  
MIN, MAX VALUES = -19.61g 26.88g 26.38g 29.00



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER PELVIS ACCELERATION Z AXIS

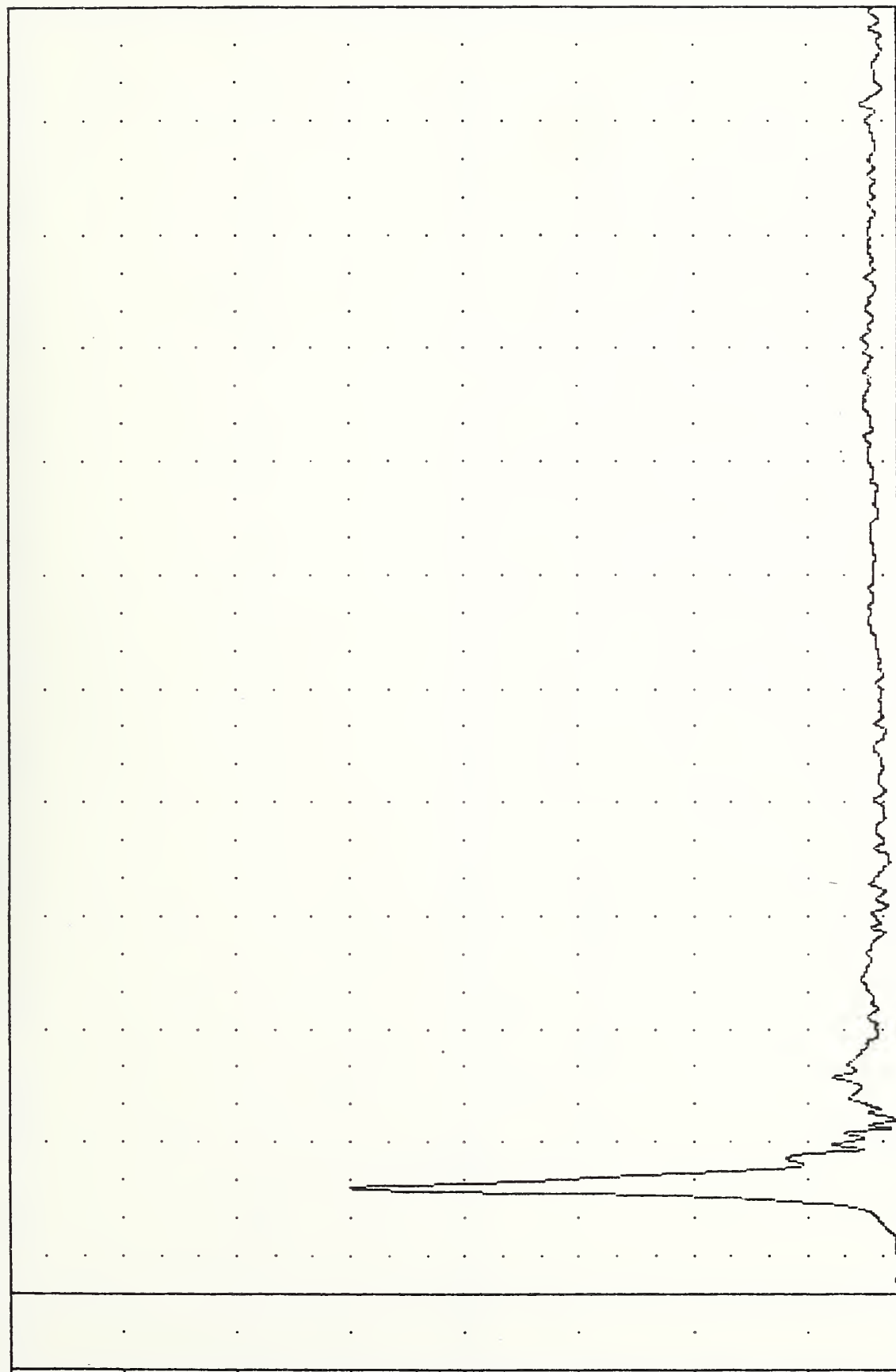
PLOT DATE 9-MAY-85 10:28:49

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
PEVRG1

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 0.07e -16.63, 239.91 e 27.75

ACCELERATION (G)



-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DRIVER PELVIS RESULTANT

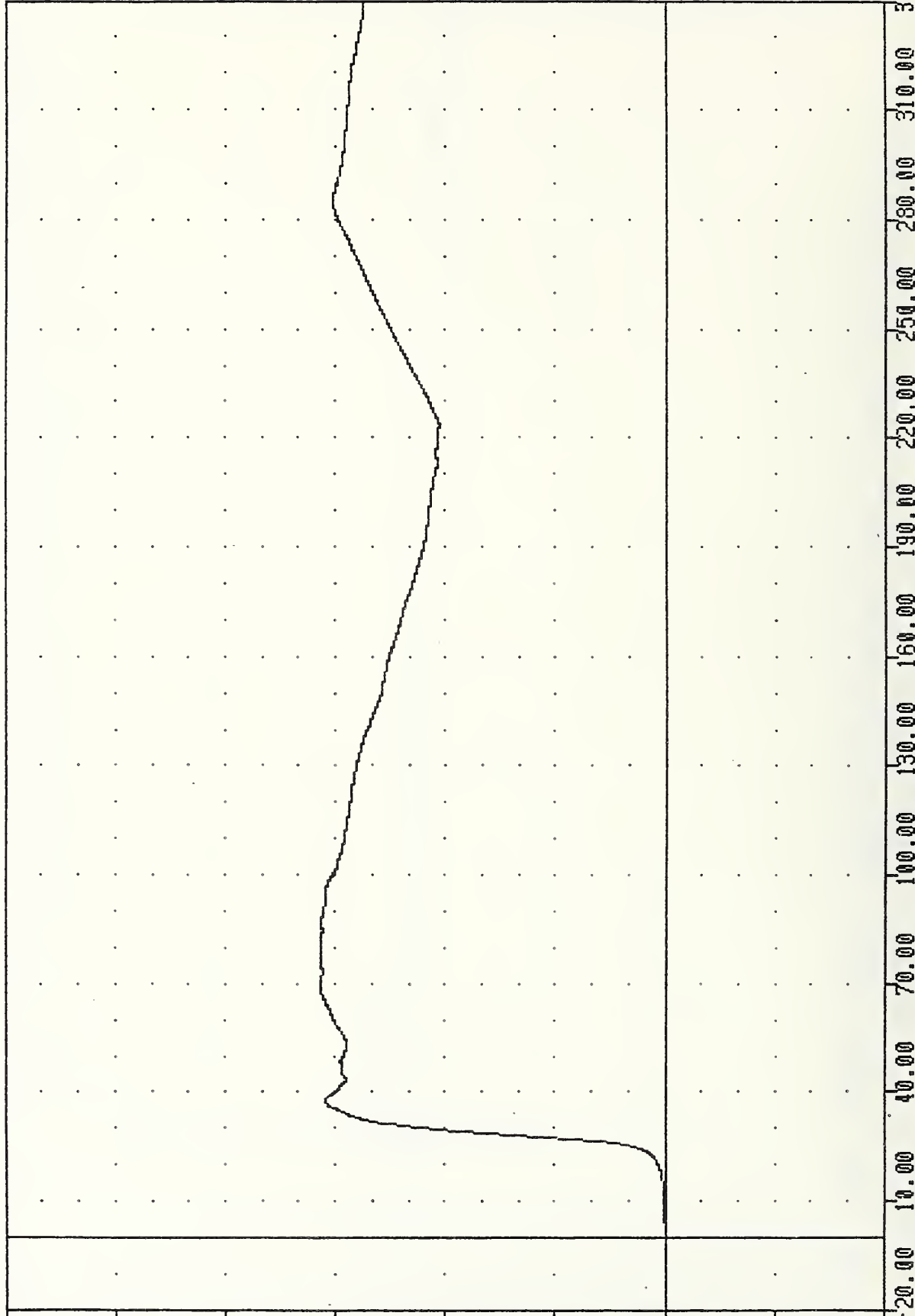
VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
PEVYV1

PLOT DATE 9-MAY-85 10:28:49

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.110 -7.88, 31.34 0 79.38

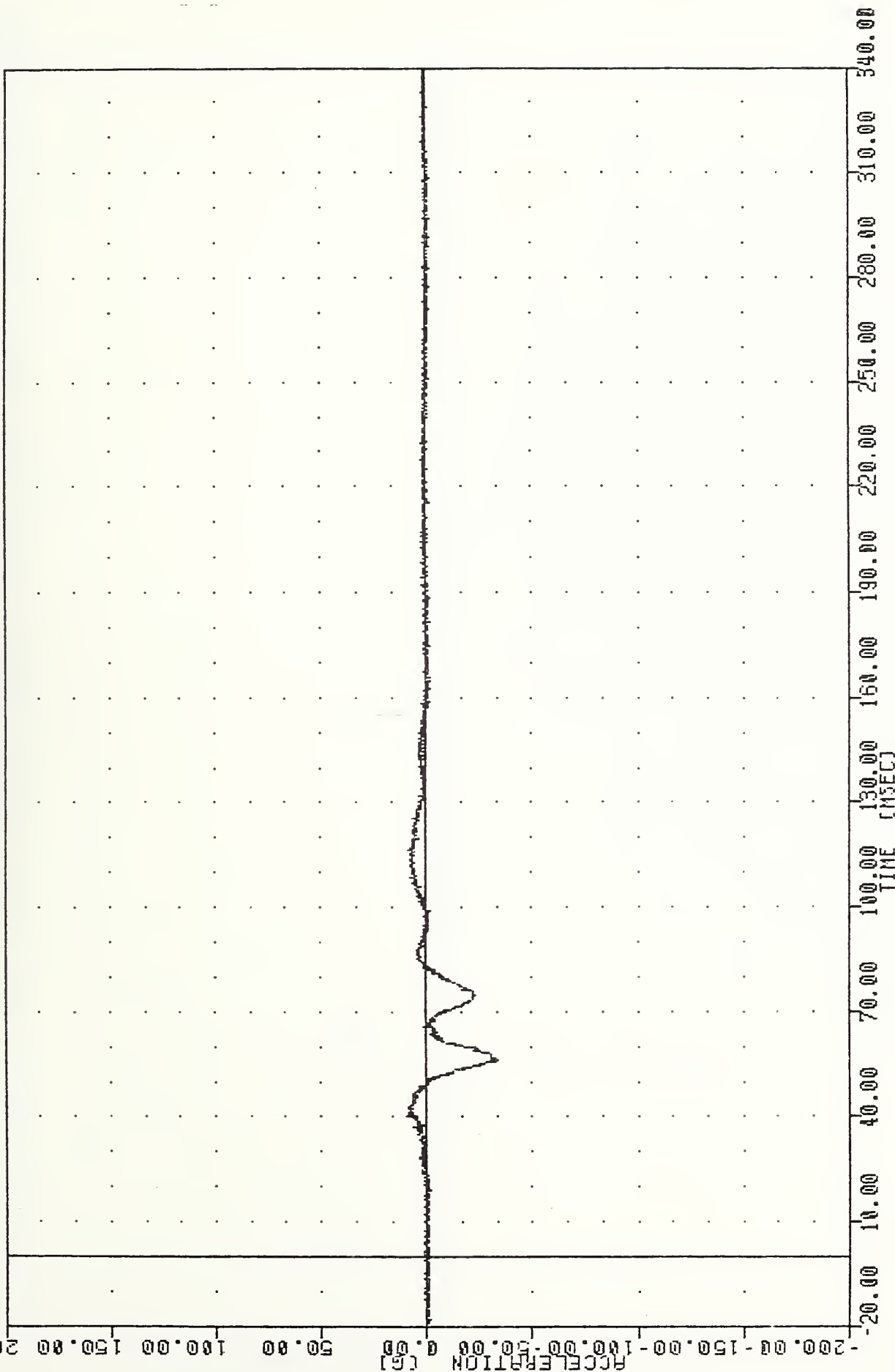
VELOCITY (MPH)



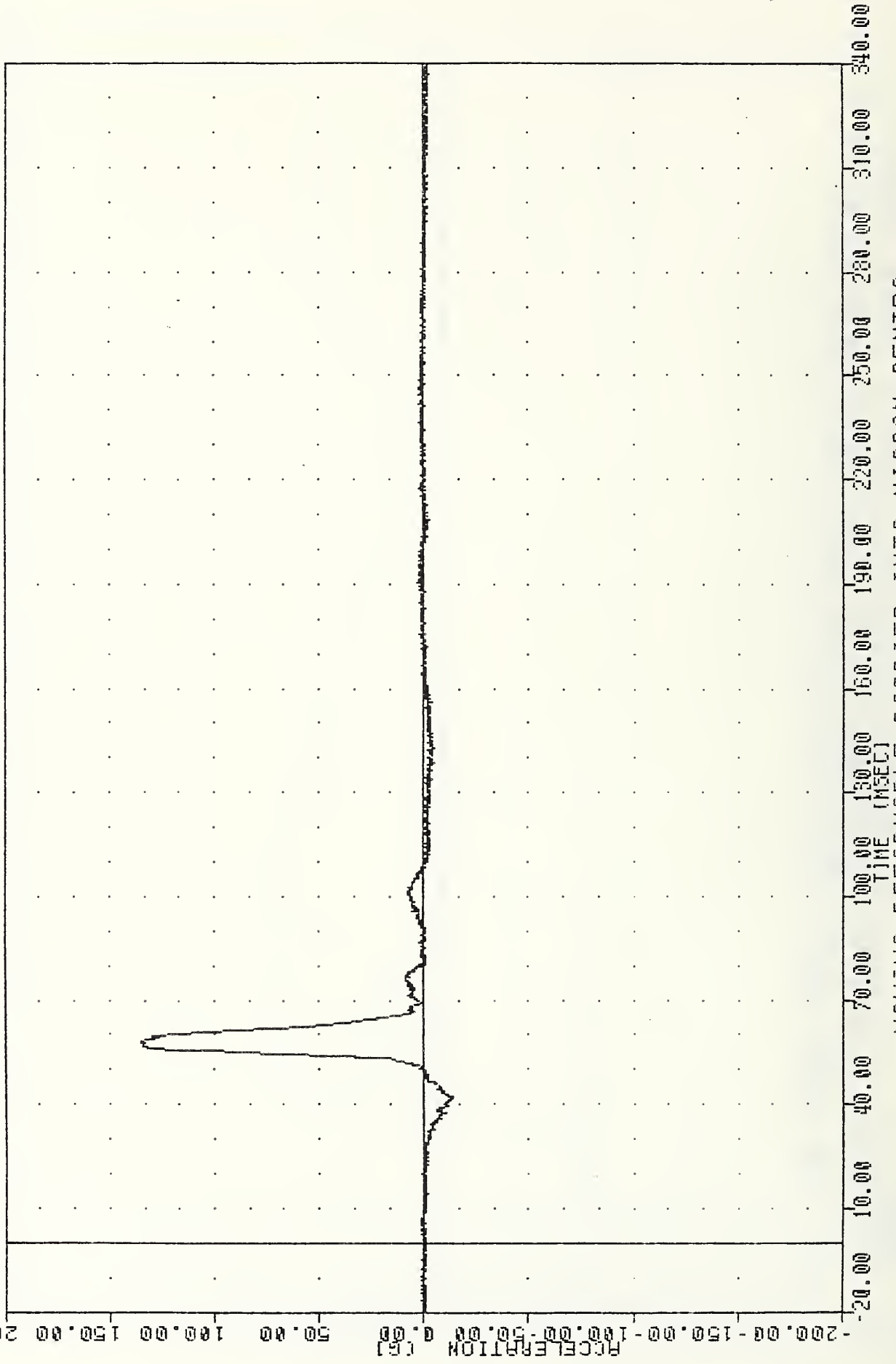
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING PEVYGI

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 HEDXG4

PLOT DATE 9-MAY-85 10:28:49  
 FILTER = ALPF 1650/ 5217/ -40  
 MIN. MAX VALUES = -33.20 55.80, 9.42 40.25



VRT , 850430  
 SI PROTECTION FROM VEH  
 85120000000  
 HEDY64  
 FILTER = ALPF 1650/ 5217/ -40  
 MIN, MAX VALUES = -13.98e 42.00, 135.23 e 58.00



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER HEAD ACCELERATION Y AXIS

PLOT DATE 9-MAY-85 10:28:49

VRT , 850430

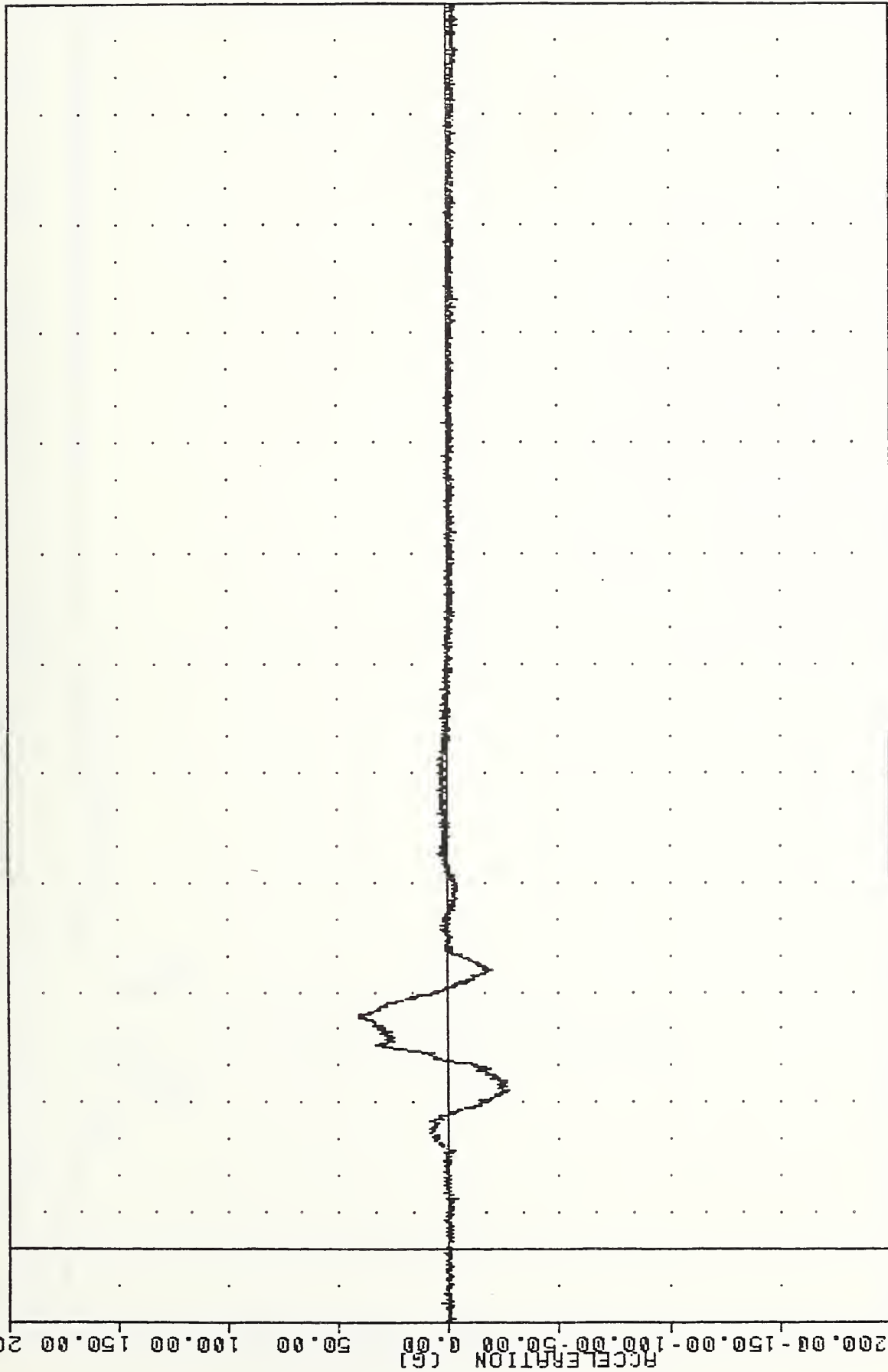
SI PROTECTION PROD VEH

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -26.80 43.25,

40.56 63.38

63.38



-200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER HEAD ACCELERATION Z AXIS

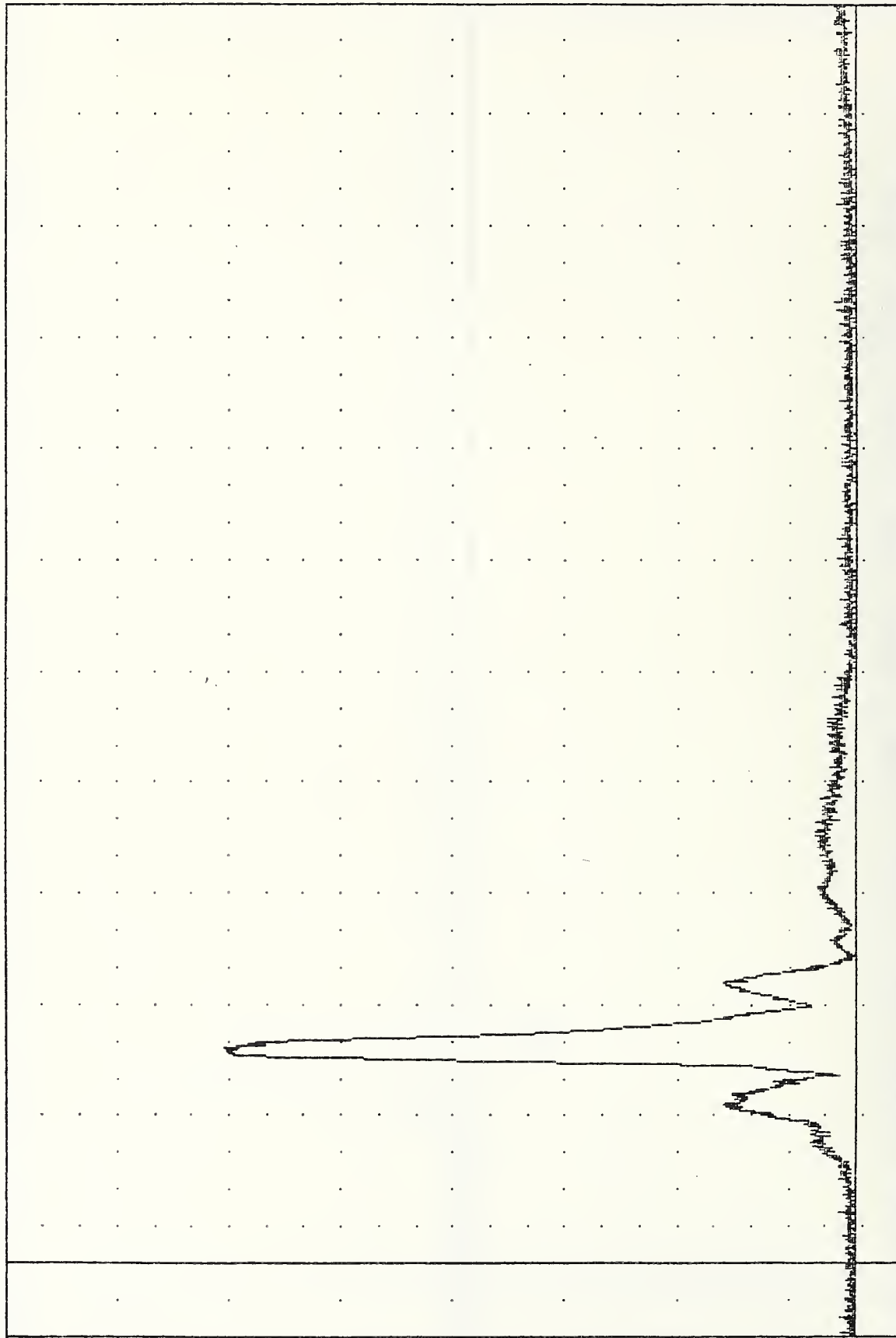
VRT , 850430  
SI PROTECTION PASO VEH  
85120000000  
HEAD64

PLOT DATE 17-JUN-85 14:29:23

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.00e -2.88, 141.09 e 58.13

ACCELERATION (G)

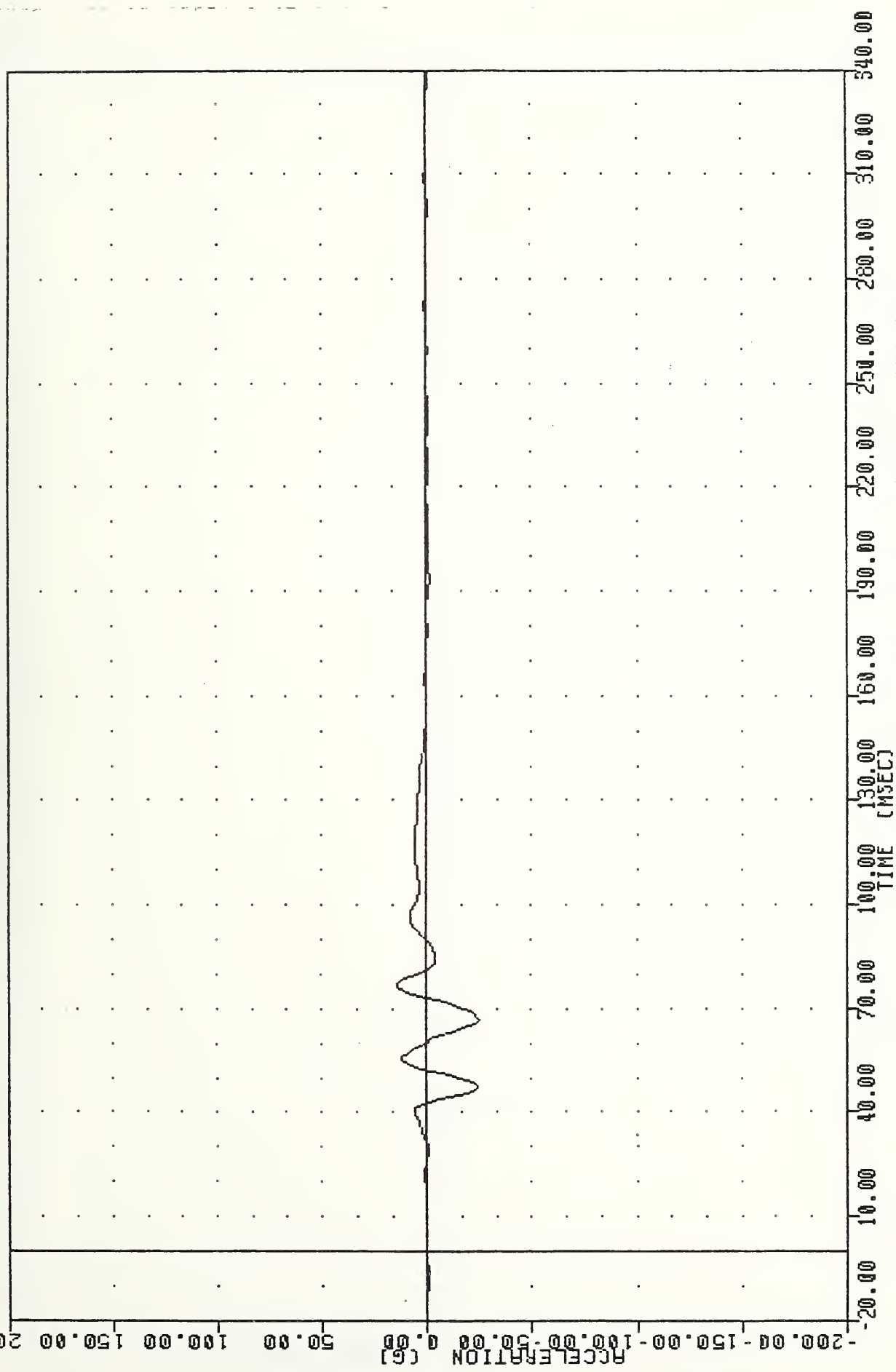


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER HEAD RESULTANT

YRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 T01XG4

PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSRI 136/ 189/ -50  
 MIN, MAX VALUES = -24.90 66.87, 14.51 76.88



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER UPPER SPINE ACCELERATION X AXIS

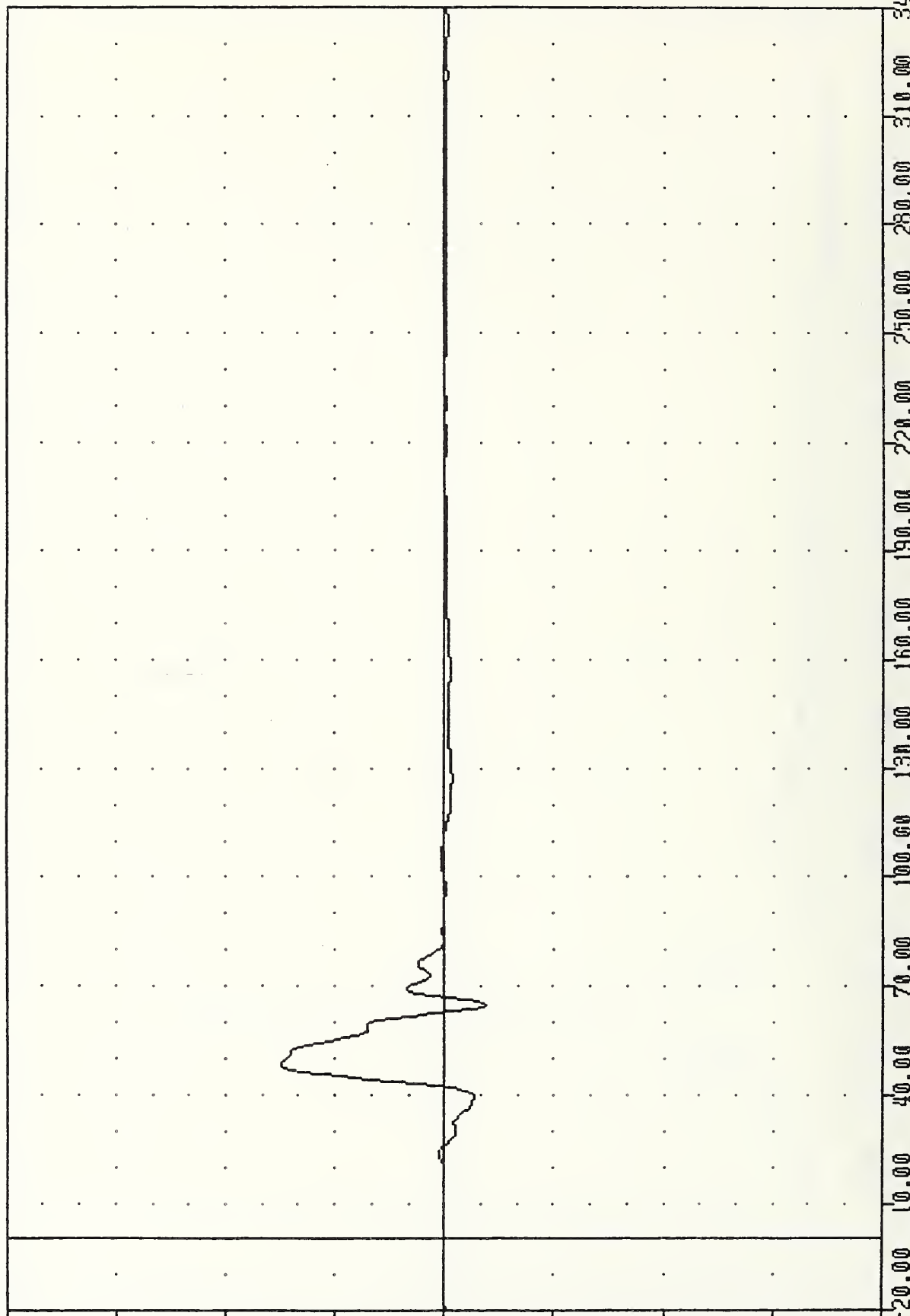
PLT DATE 9-MAY-85 10:25:49

VAT , 850430  
SI PROTECTION PRD YEH  
85120000000  
T01Y64

FILTER = HSRI 136/ 189/ -50

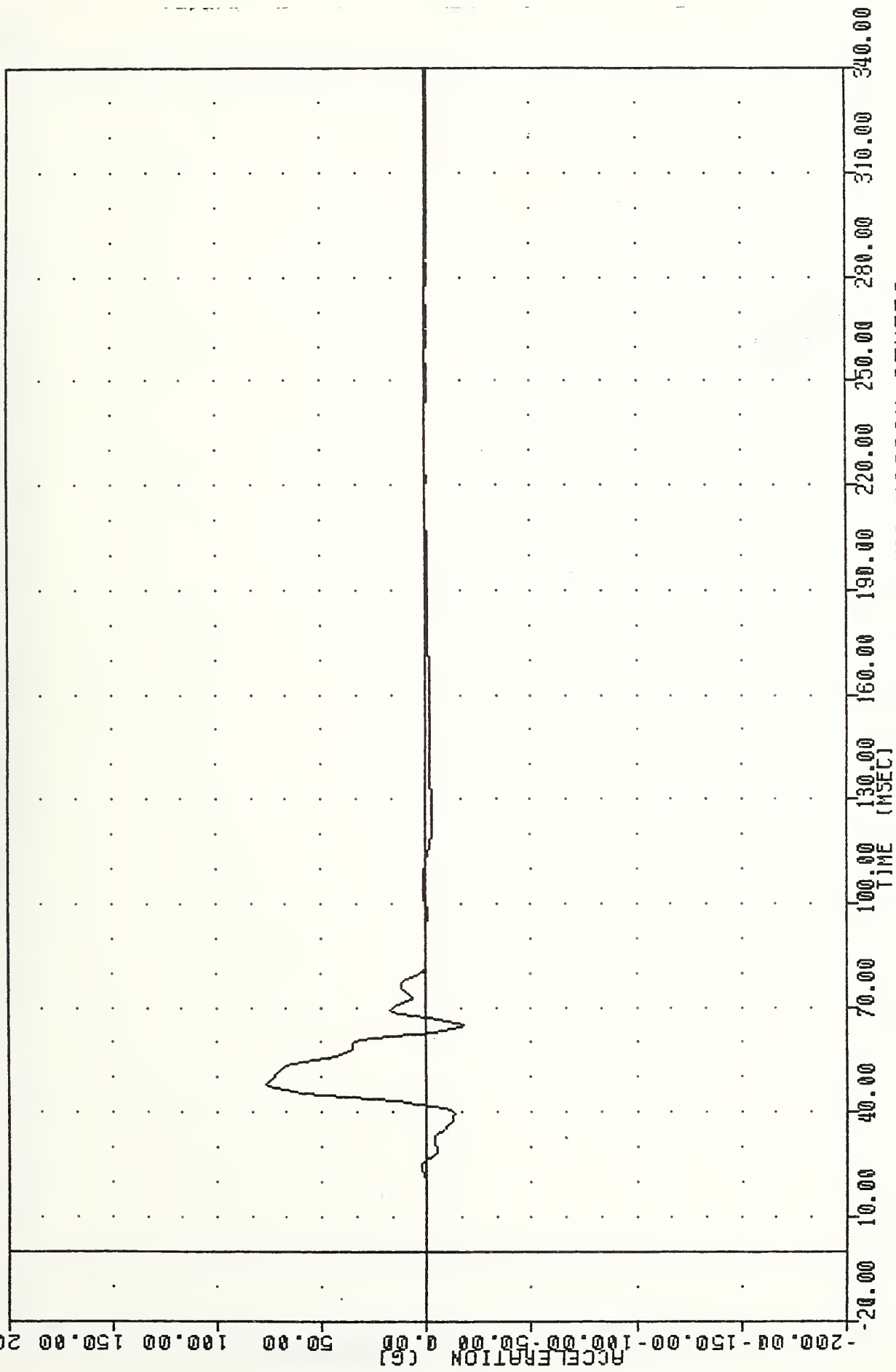
MIN. MAX VALUES = -18.35e 65.00, 74.81 e 48.13

ACCELERATION (G)



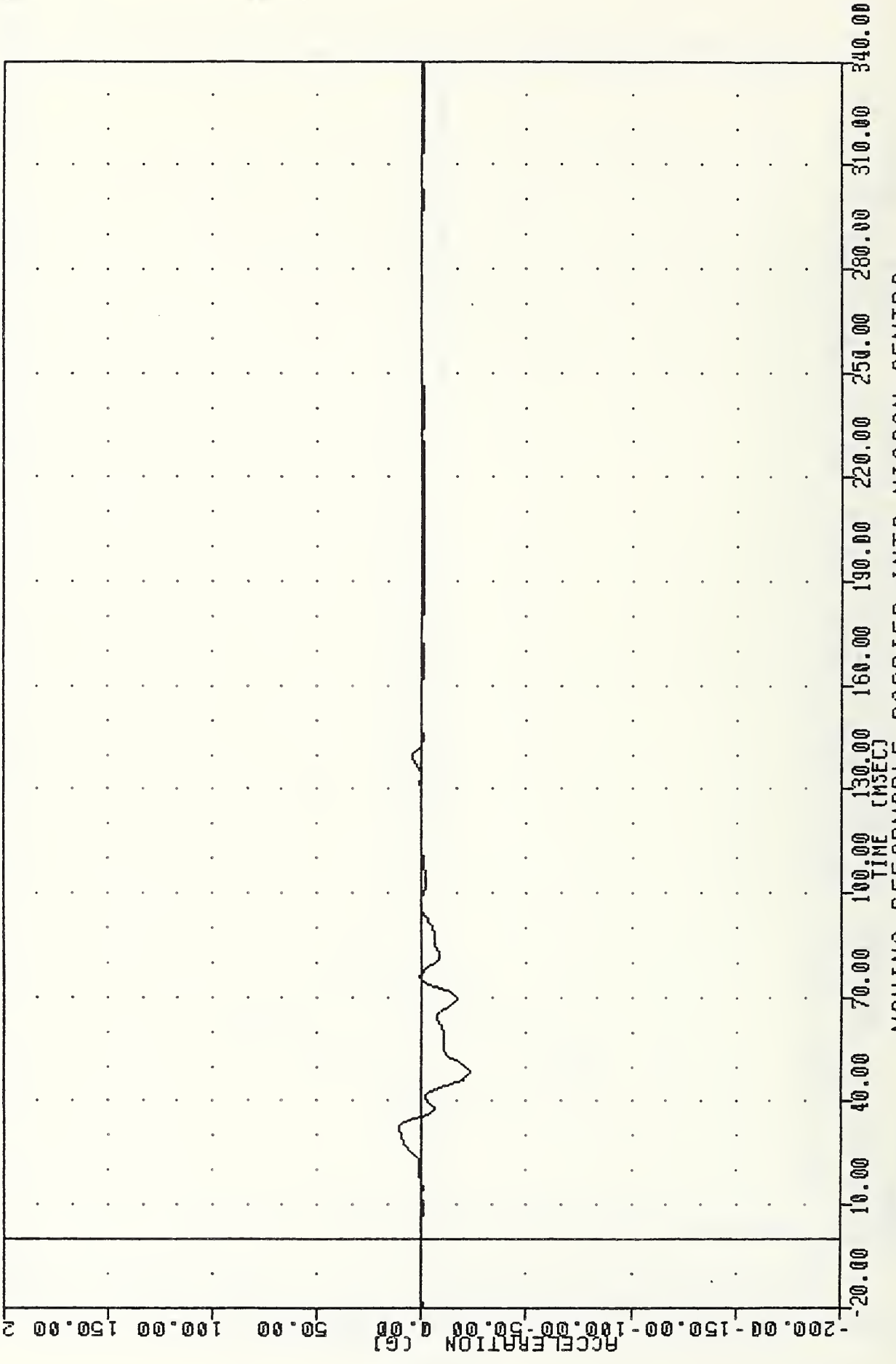
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER UPPER SPINE ACCELERATION Y AXIS

VRT . , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 701YGD  
 PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSR( 136/ 189/ -50  
 MIN, MAX VALUES = -17.73g 65.00 , 76.10 g 48.13



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER UPPER SPINE ACCELERATION #2 Y AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 T01Z64  
 PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -22.95e 48.13 , 11.07 e 31.88



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER UPPER SPINE ACCELERATION Z AXIS

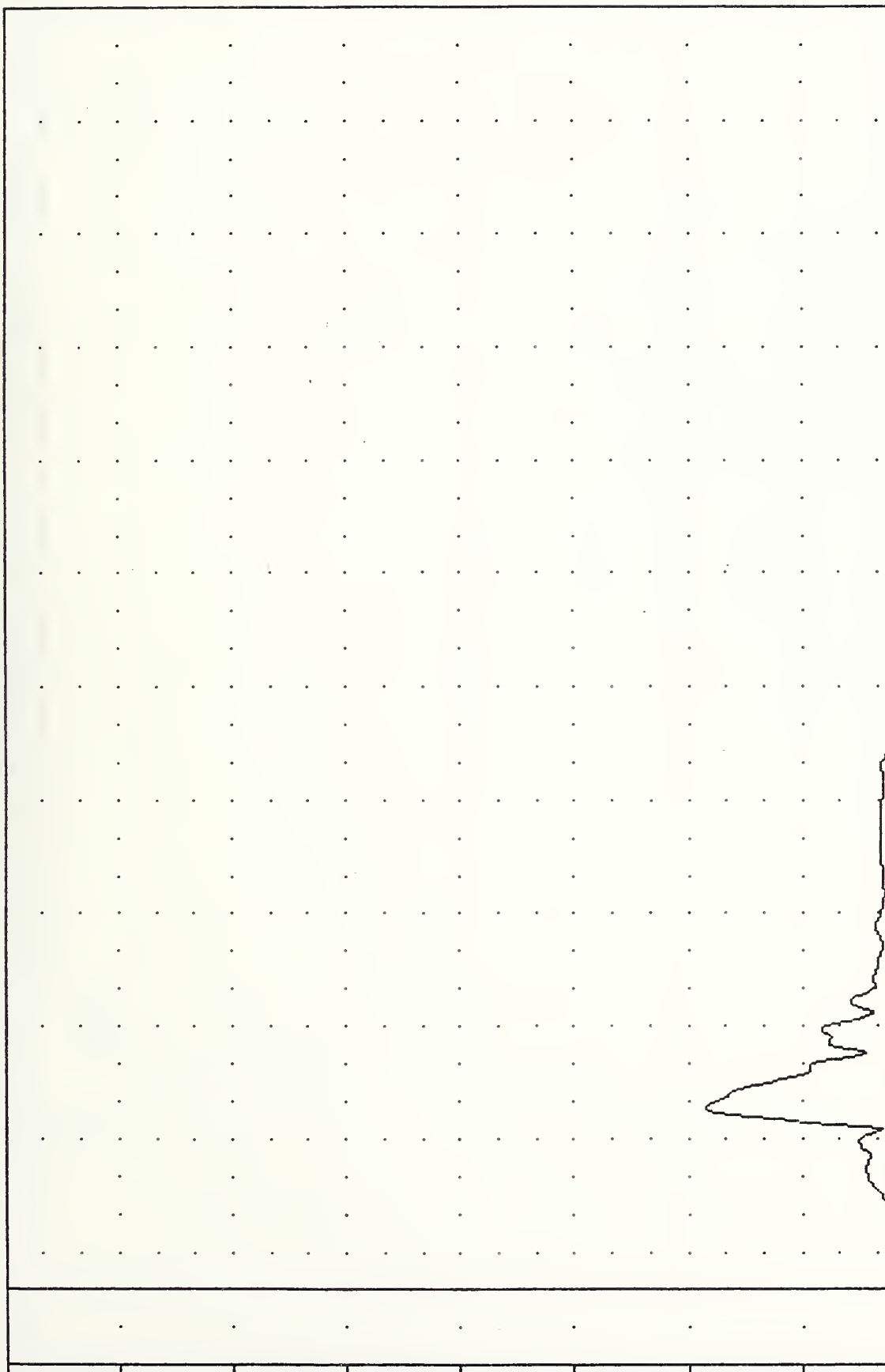
PLOT DATE 9-MAY-85 10:25:49

VRT , 850430  
SI PROTECTION PROD YEH  
85120000000  
T01R64

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.11e 5.00. 81.72 e 48.13

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER UPPER SPINE RESULTANT

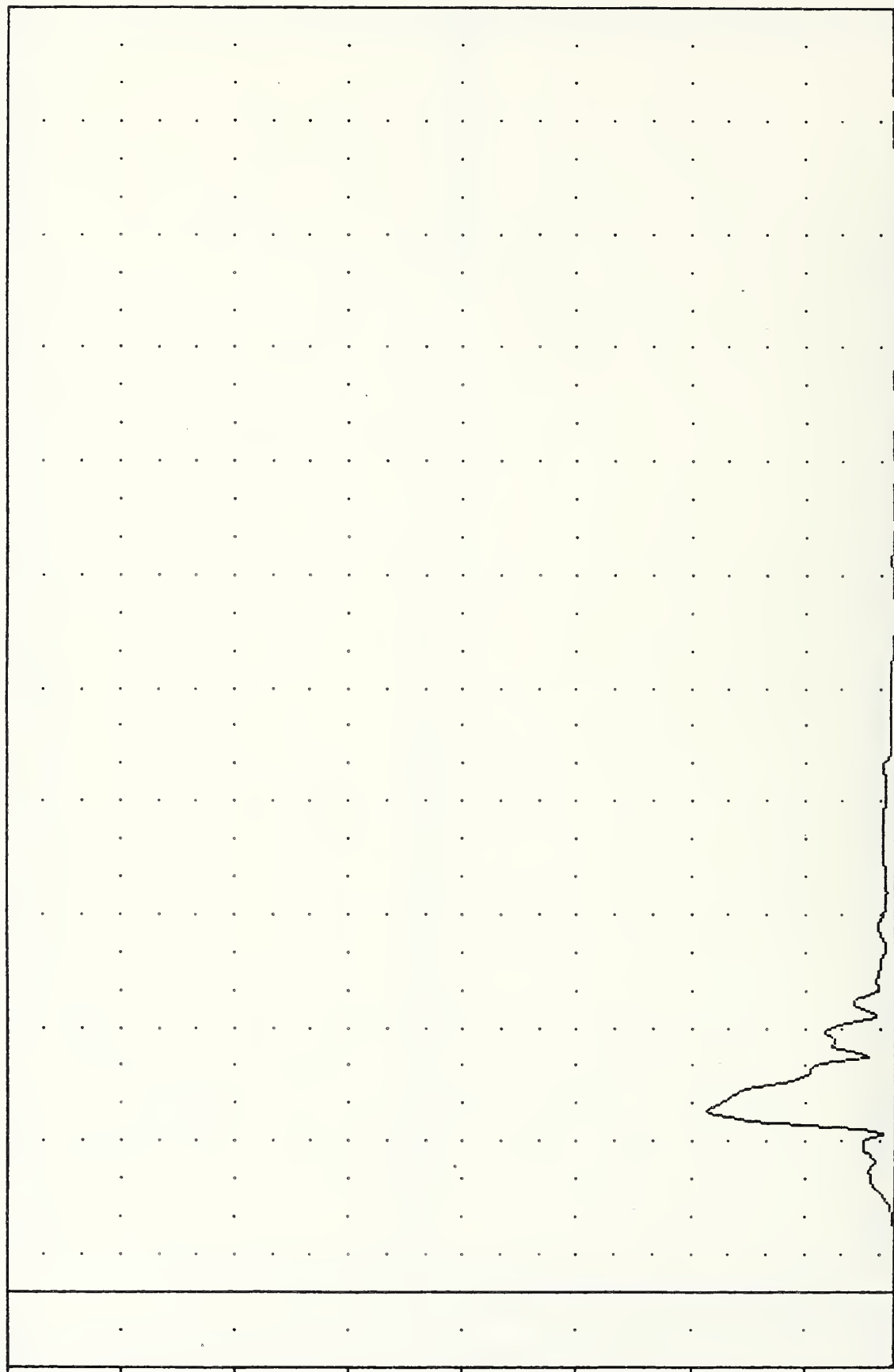
VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
T01RGD

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

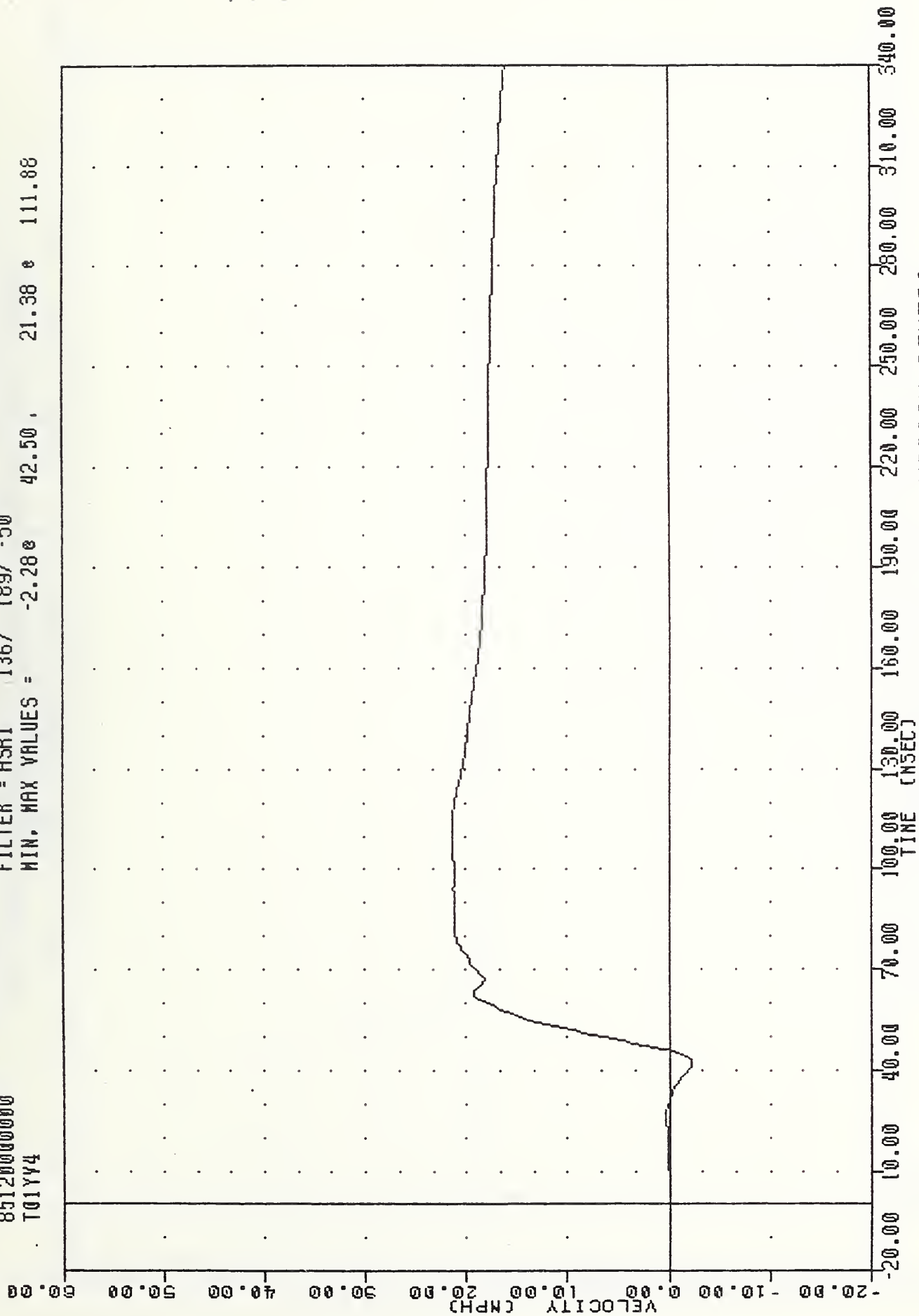
MIN. MAX VALUES = 0.138 256.25 , 82.91 @ 48.13

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER UPPER SPINE RESULTANT USING T01YGD

VAT ., 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 T01Y4  
 PLOT DATE 9-MAY-85 10:27:48  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -2.28e 42.50, 21.38 e 111.88



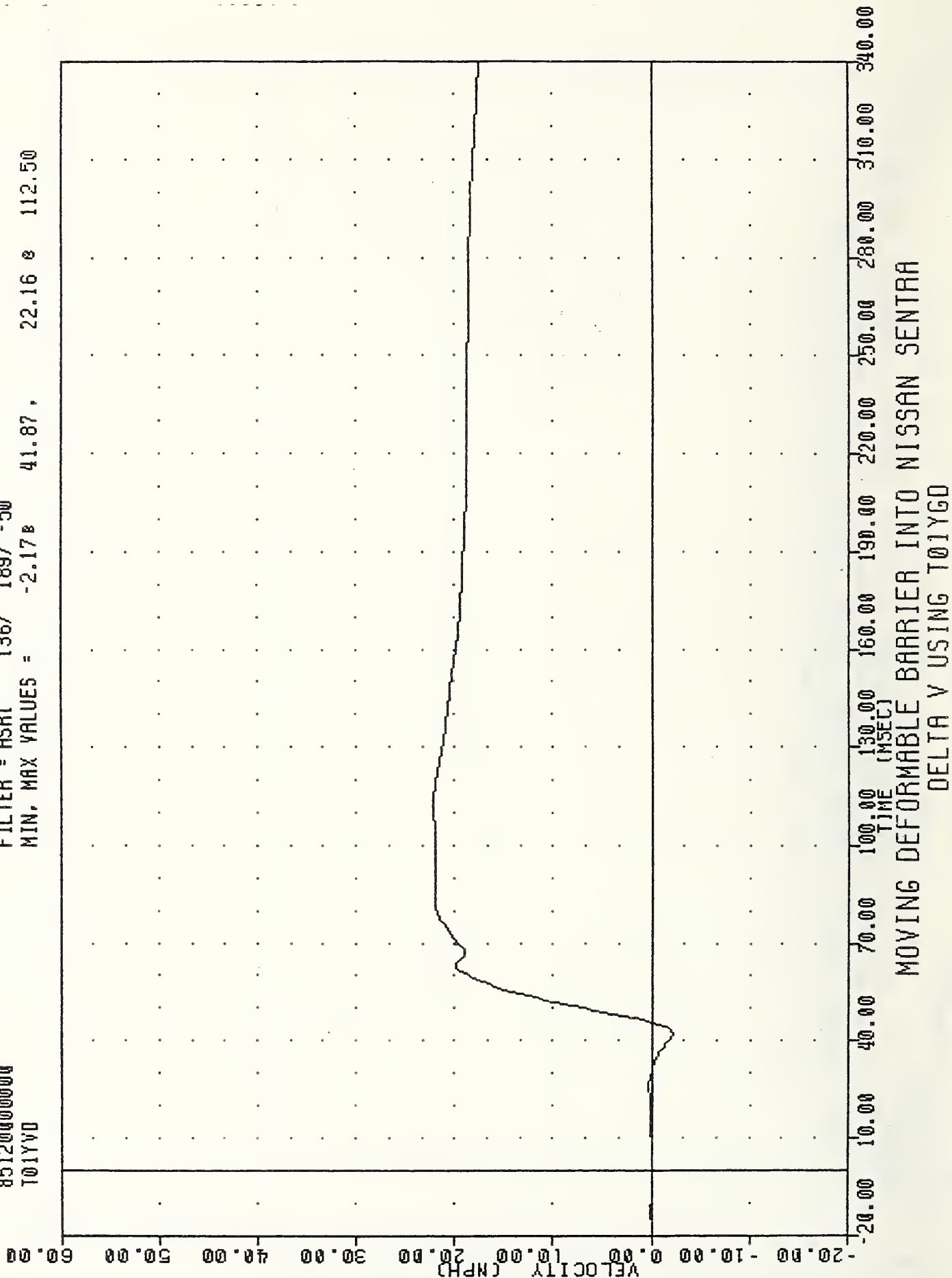
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING T01Y4

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
T01YVD

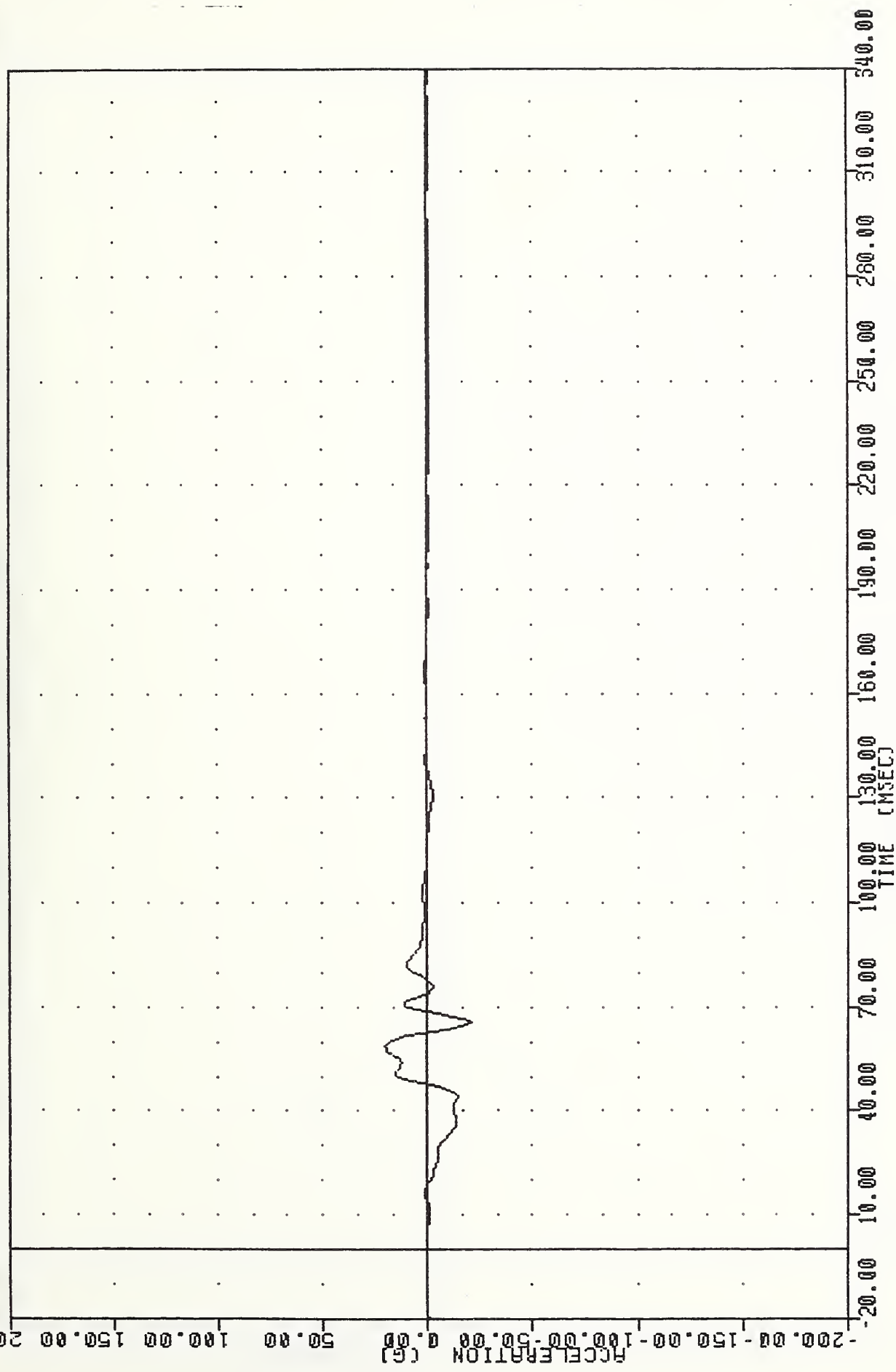
PLOT DATE 9-MAY-85 10:27:48

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -2.17 41.87, 22.16 112.50



VRT . . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 T12XG4  
 FILTER = HSRI 136/ 189/ -50  
 MIN, MAX VALUES = -21.07g 65.63g 19.90g 58.75  
 PLOT DATE 9-MAY-85 10:25:49



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER LOWER SPINE ACCELERATION X AXIS

PLOT DATE 9-MAY-85 10:25:49

VRT , 850430

SI PROTECTION PROD YEH

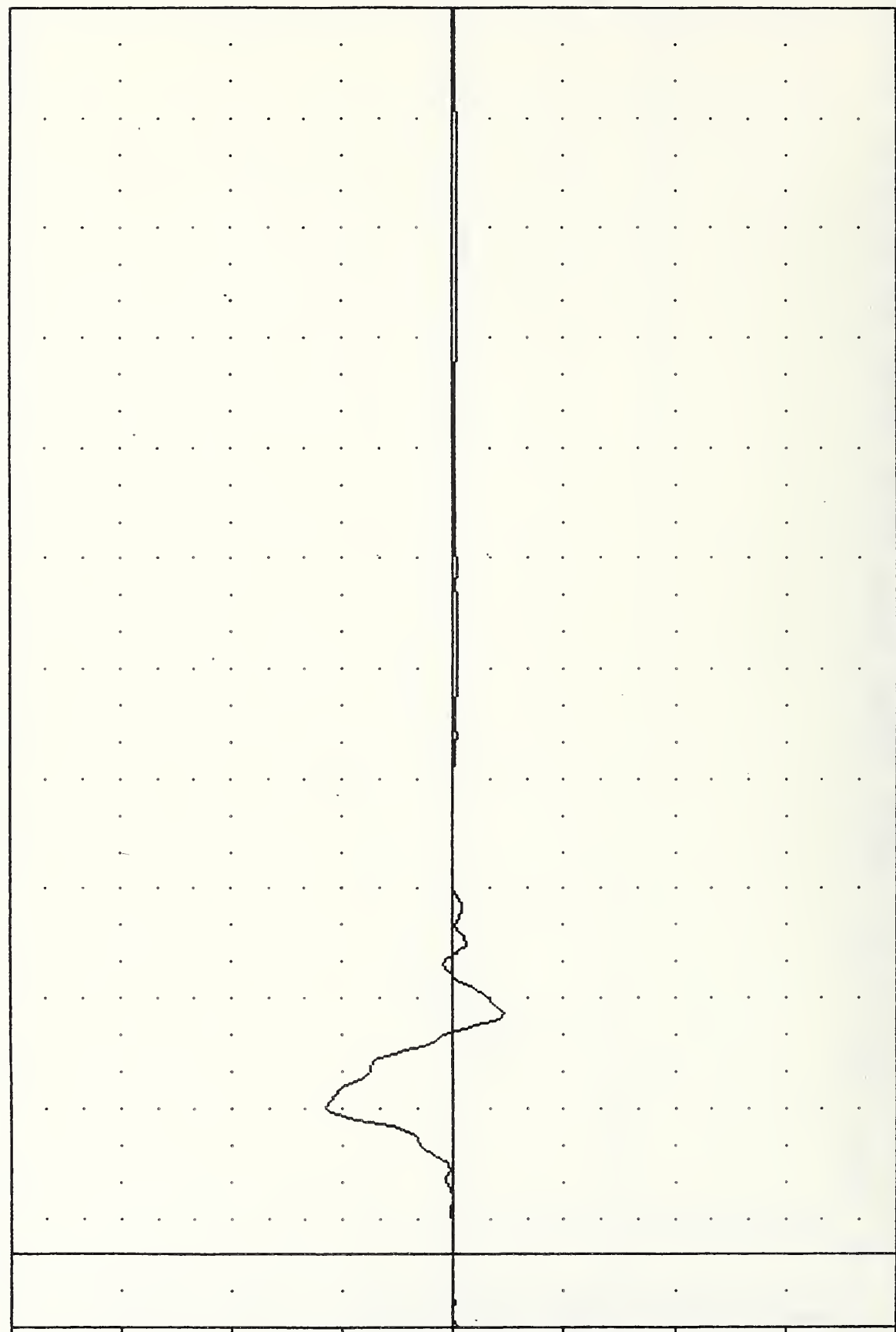
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -22.74 65.63 57.62 40.00

851200000000

T12Y64

ACCELERATION (G)



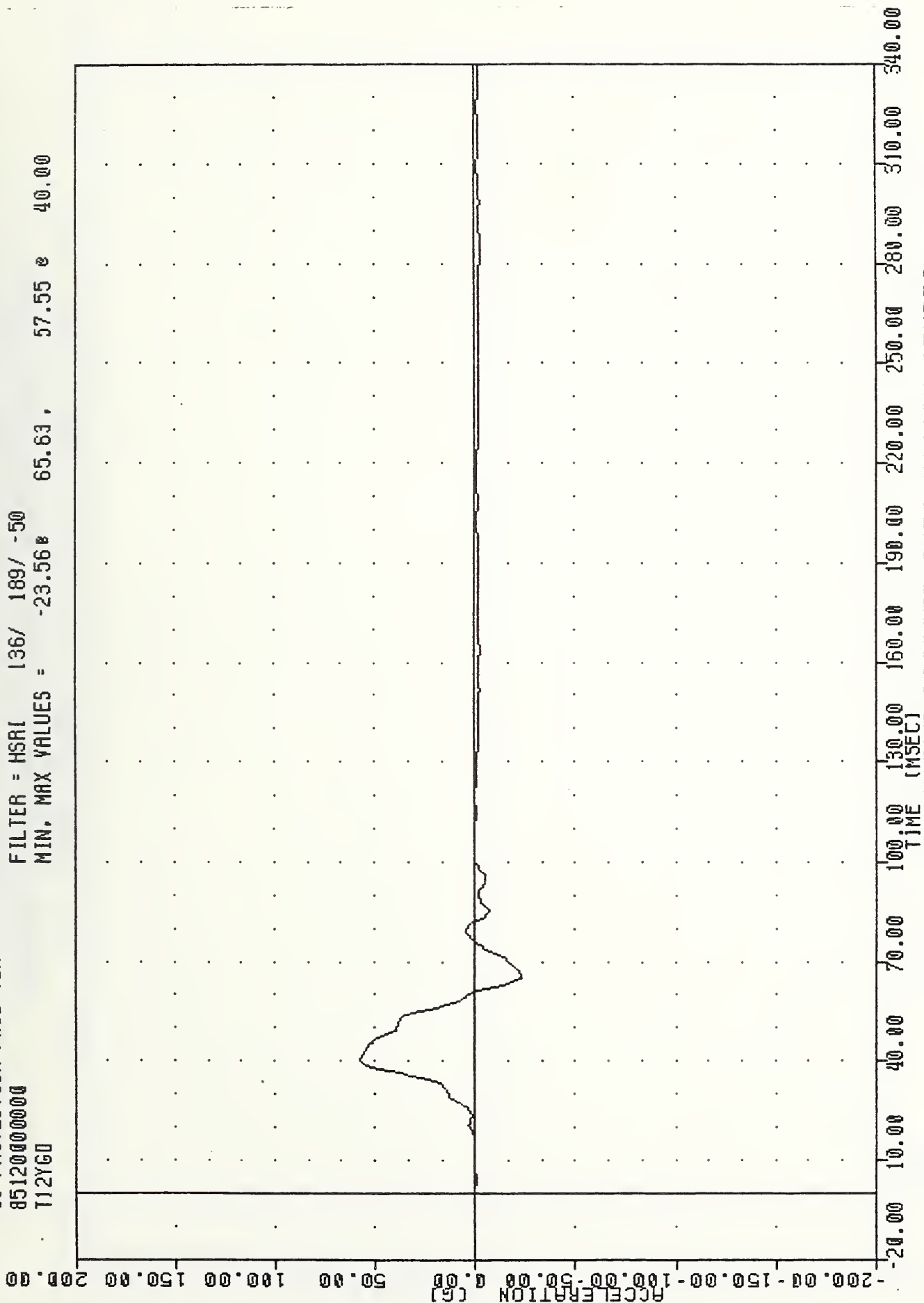
-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER LOWER SPINE ACCELERATION Y AXIS

PLOT DATE 9-MAY-85 10:25:49

VRT . , 850430  
SI PROTECTION PROD VEH  
85120000000  
T12Y60

FILTER = HSRI 136/ 189/ -50  
MIN. MAX VALUES = -23.56 65.63 , 57.55 40.00



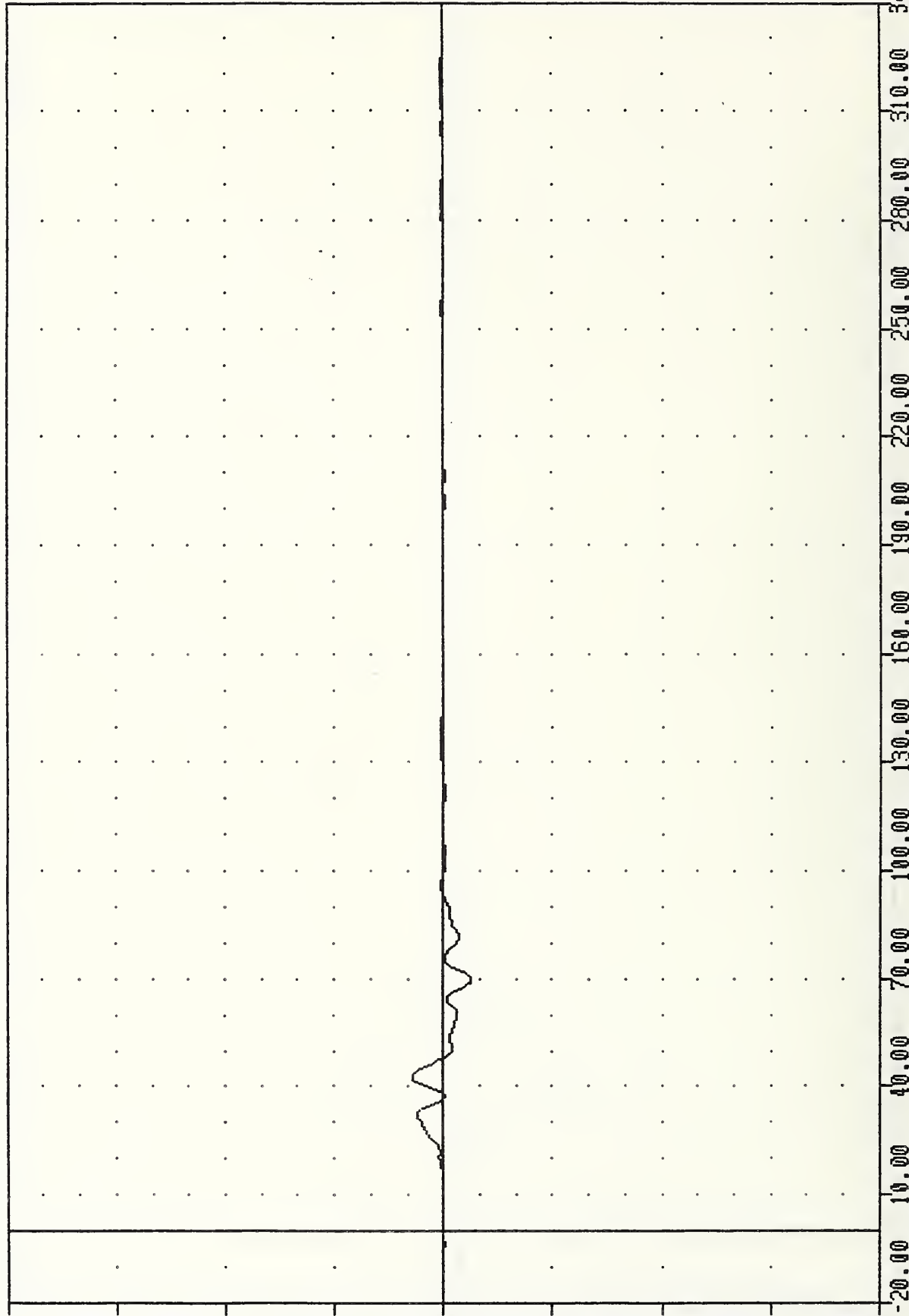
VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
T12ZG4

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -12.88 69.38 , 14.48 42.50

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER LOWER SPINE ACCELERATION Z AXIS

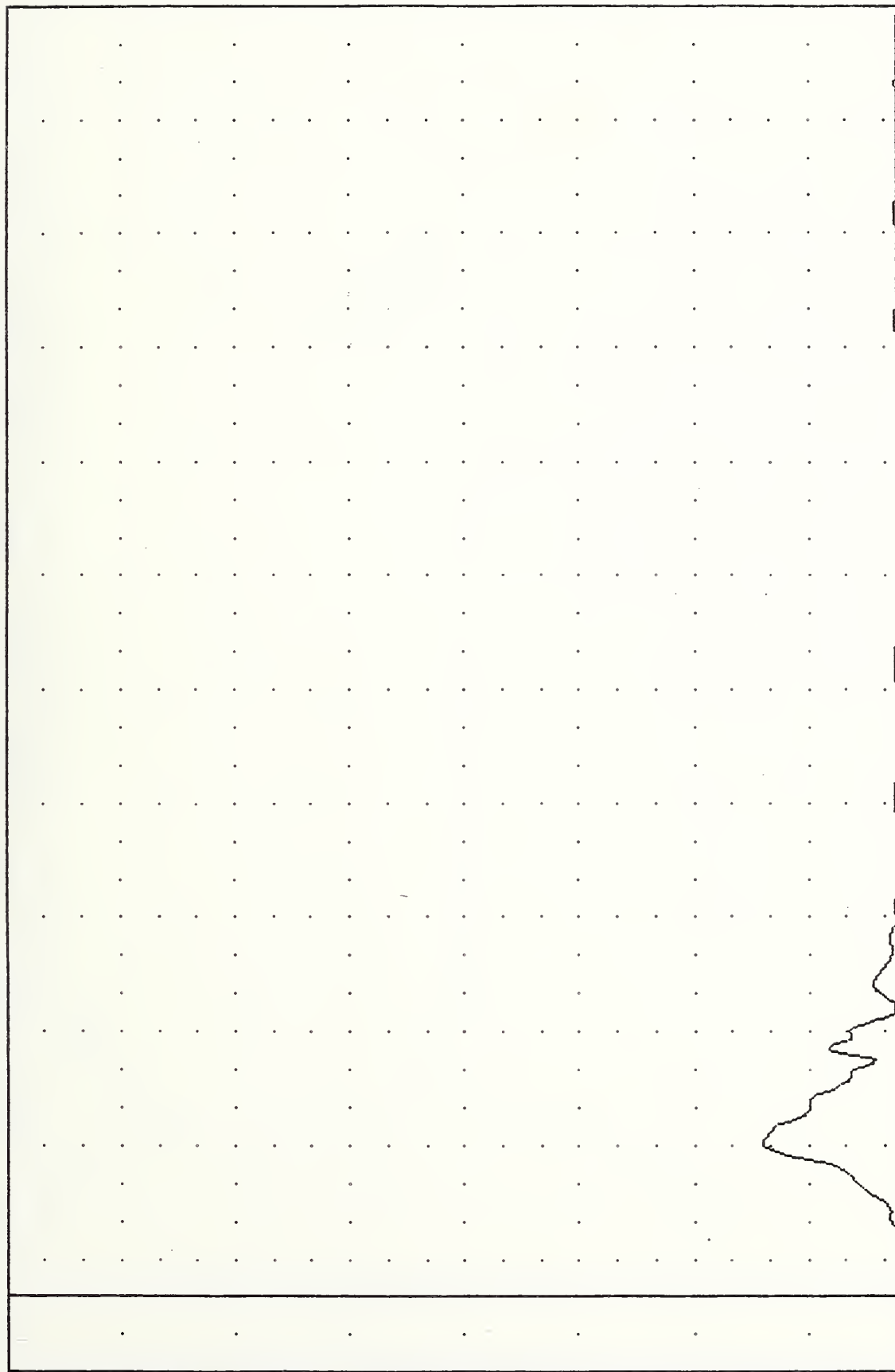
VRT . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 T12R64

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.108 0.00 59.63 40.63

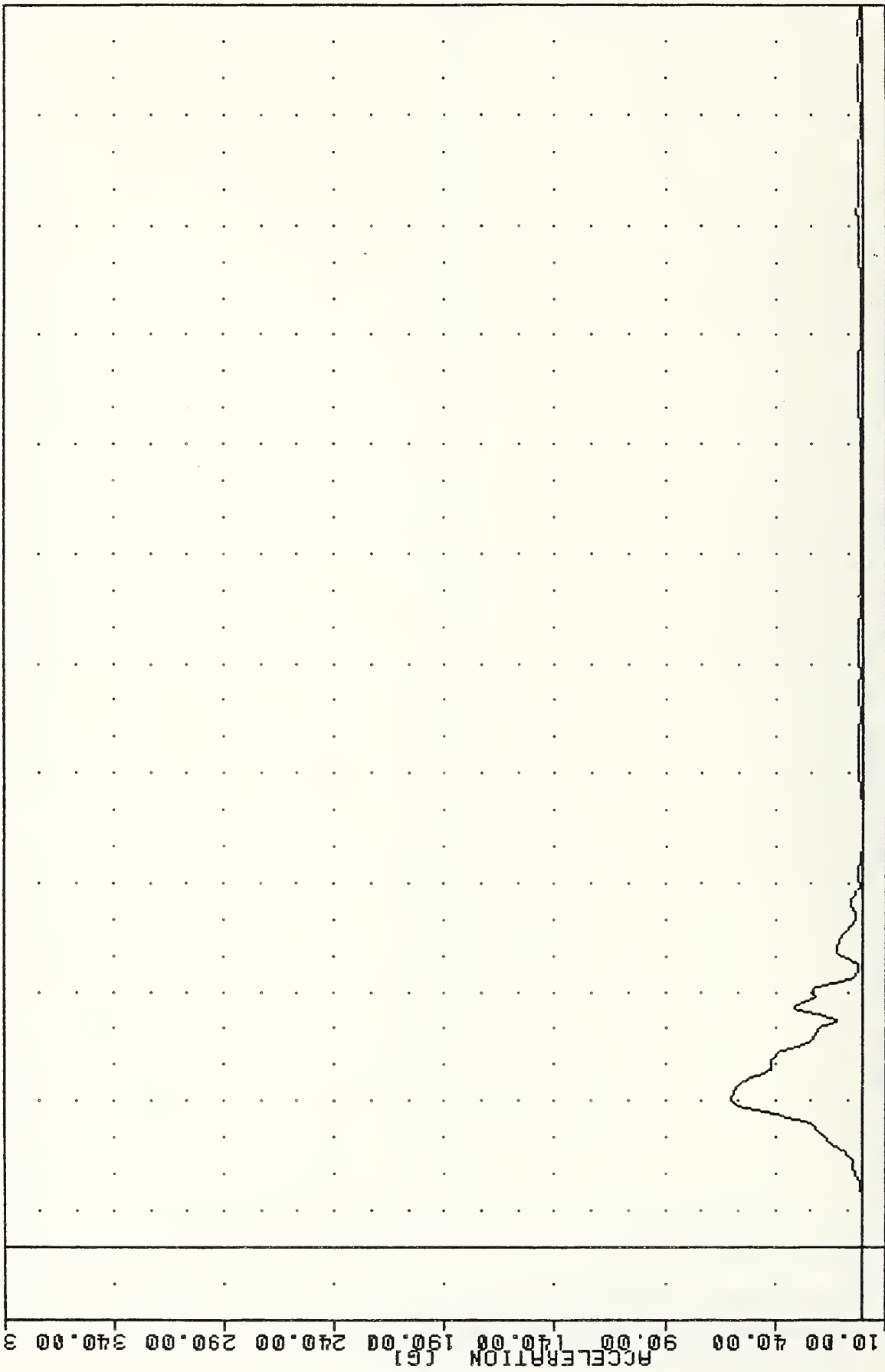
ACCELERATION (G)



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER LOWER SPINE RESULTANT

VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 T12RGO  
 PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSRI 136/ 189/ -50  
 MIN, MAX VALUES = 0.09e 118.13, 59.71 e 40.63



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER LOWER SPINE RESULTANT USING T12YGO

PLOT DATE 9-MAY-85 10:27:48

VRI . . , 850430

SI PROTECTION PROD VEH

851200000000

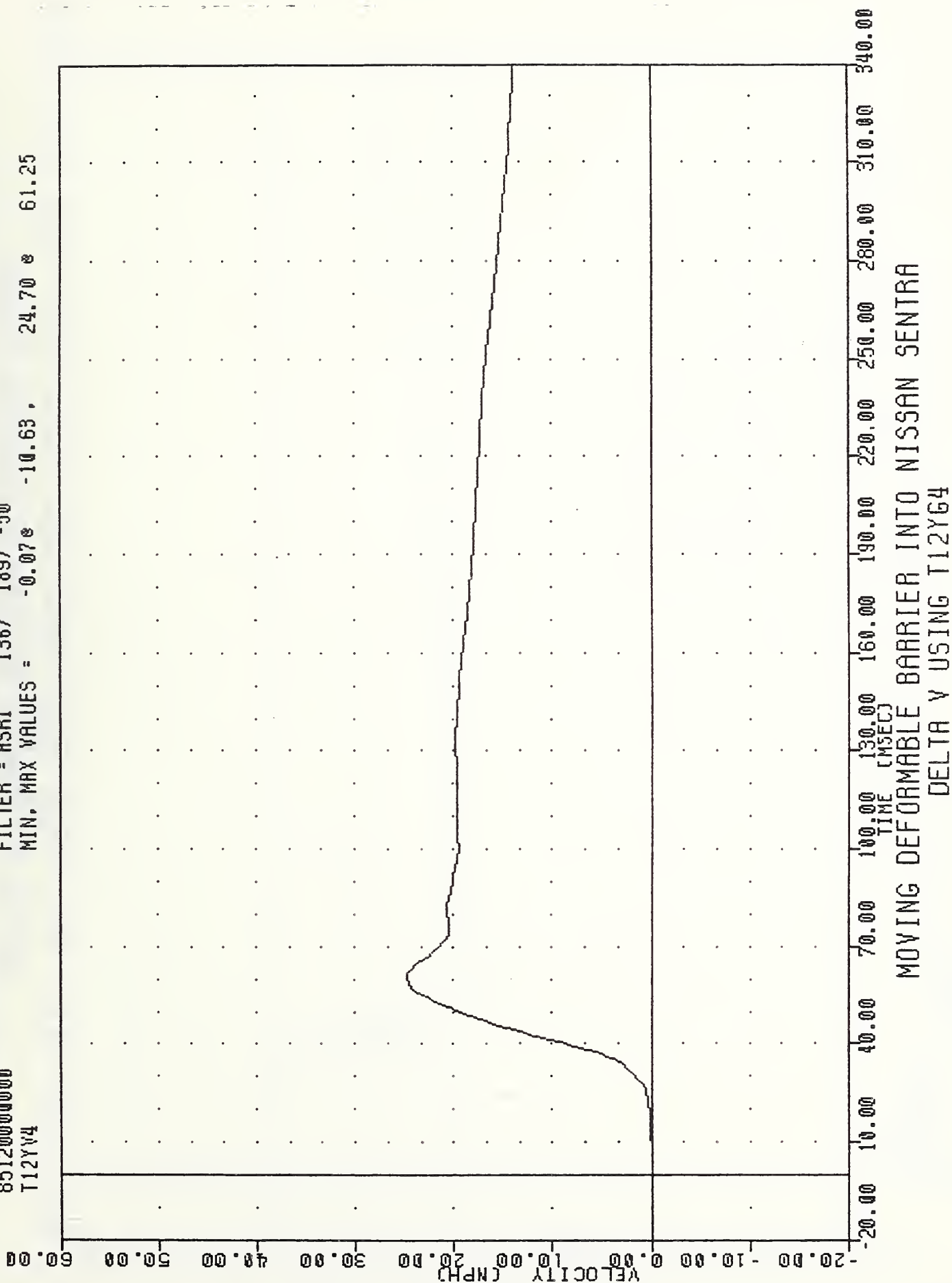
T12YV4

FILTER = HSRI 136/ 189/ -50

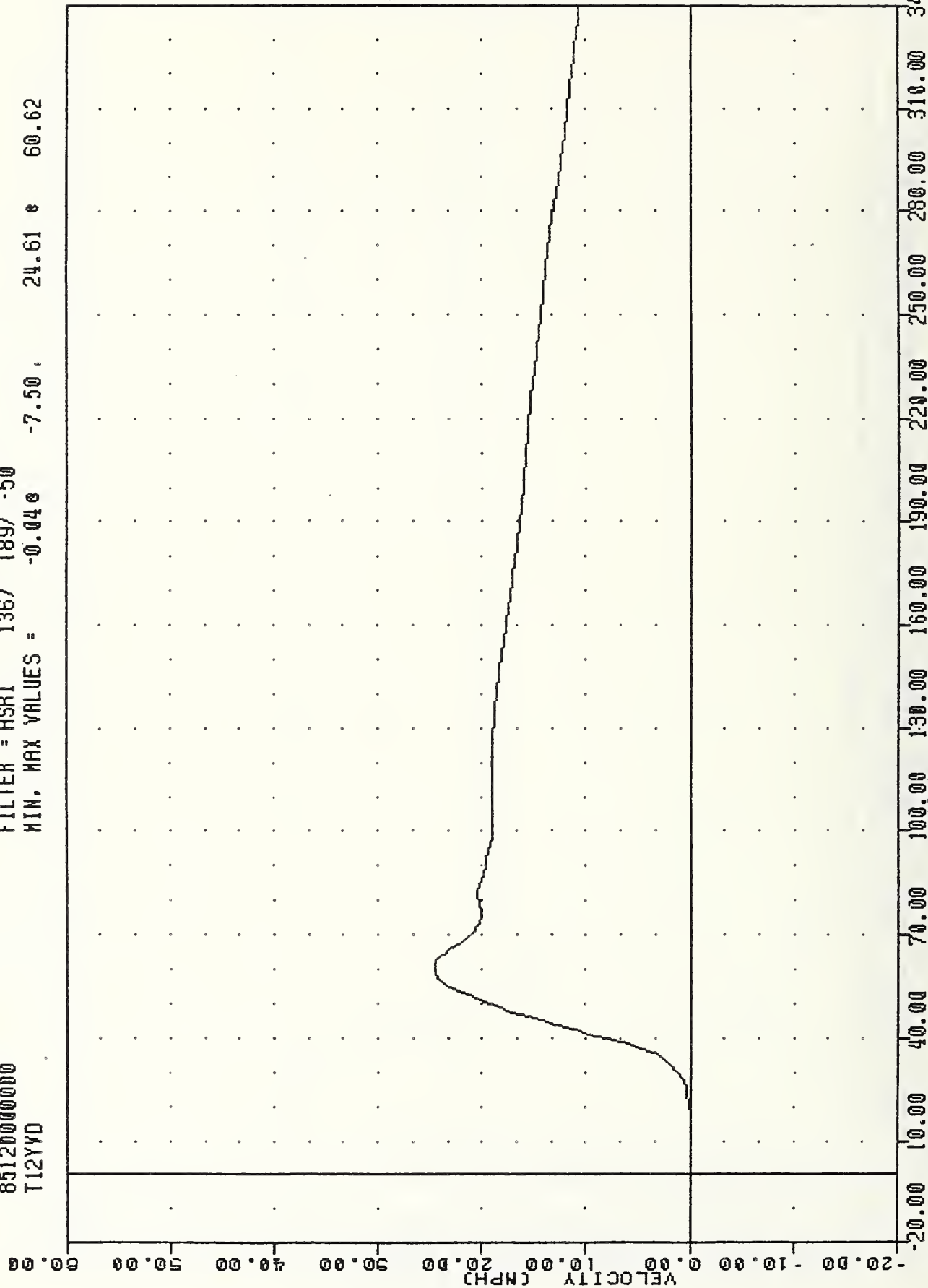
MIN. MAX VALUES = -0.07e -10.63.

24.70 e

61.25



VRT , 850430  
 SI PROTECTION PROD YEH  
 85120000000  
 T12YGD  
 PLOT DATE 9-MAY-85 10:27:48  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -0.040 -7.50 24.61 60.62



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING T12YGD

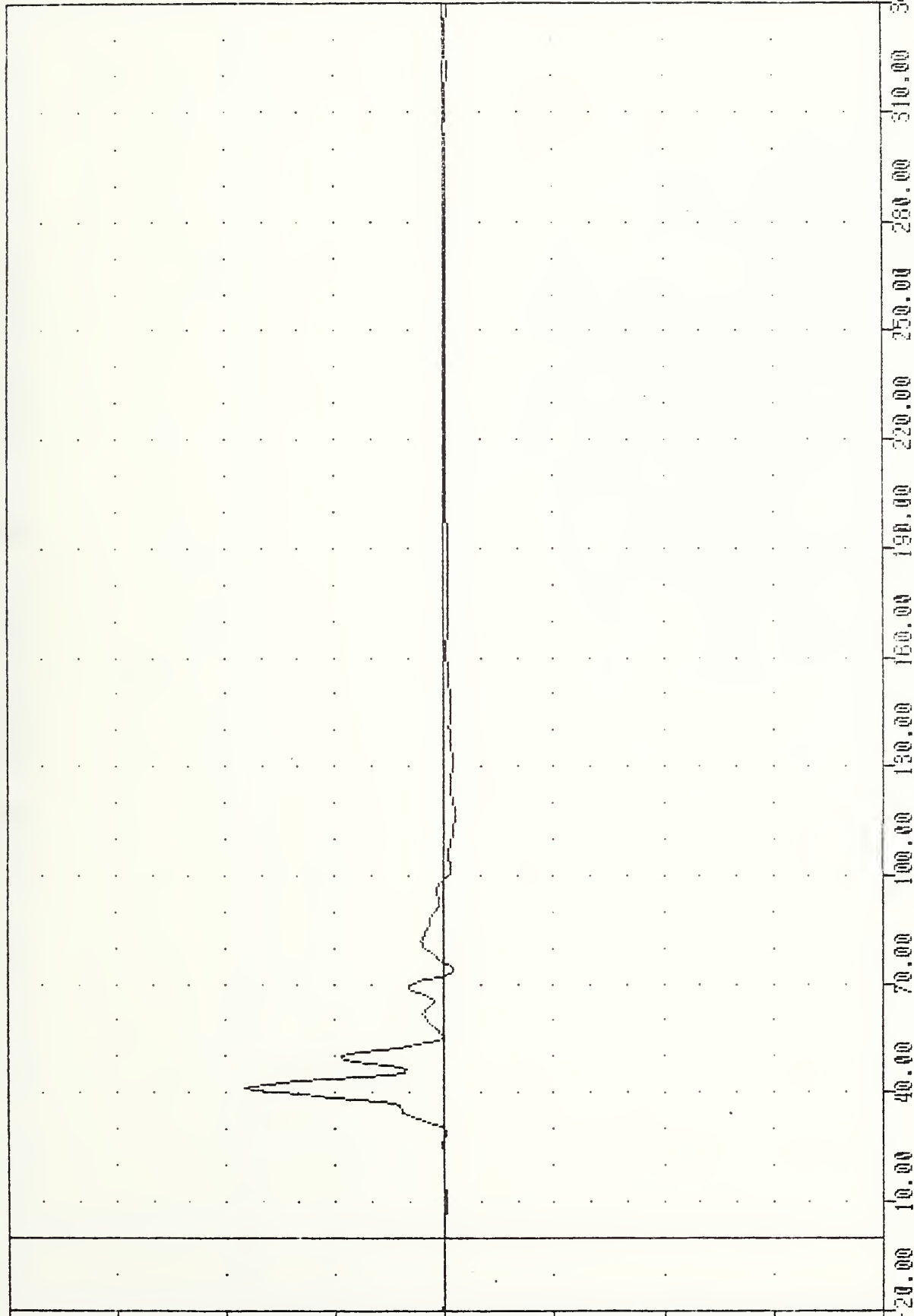
VBT  
SI PROTECTION PROD VEH  
851200000000  
LURY64

PLOT DATE 17-JUN-85 14:33:33

FILTER = HSRI 136/ 189/ -50

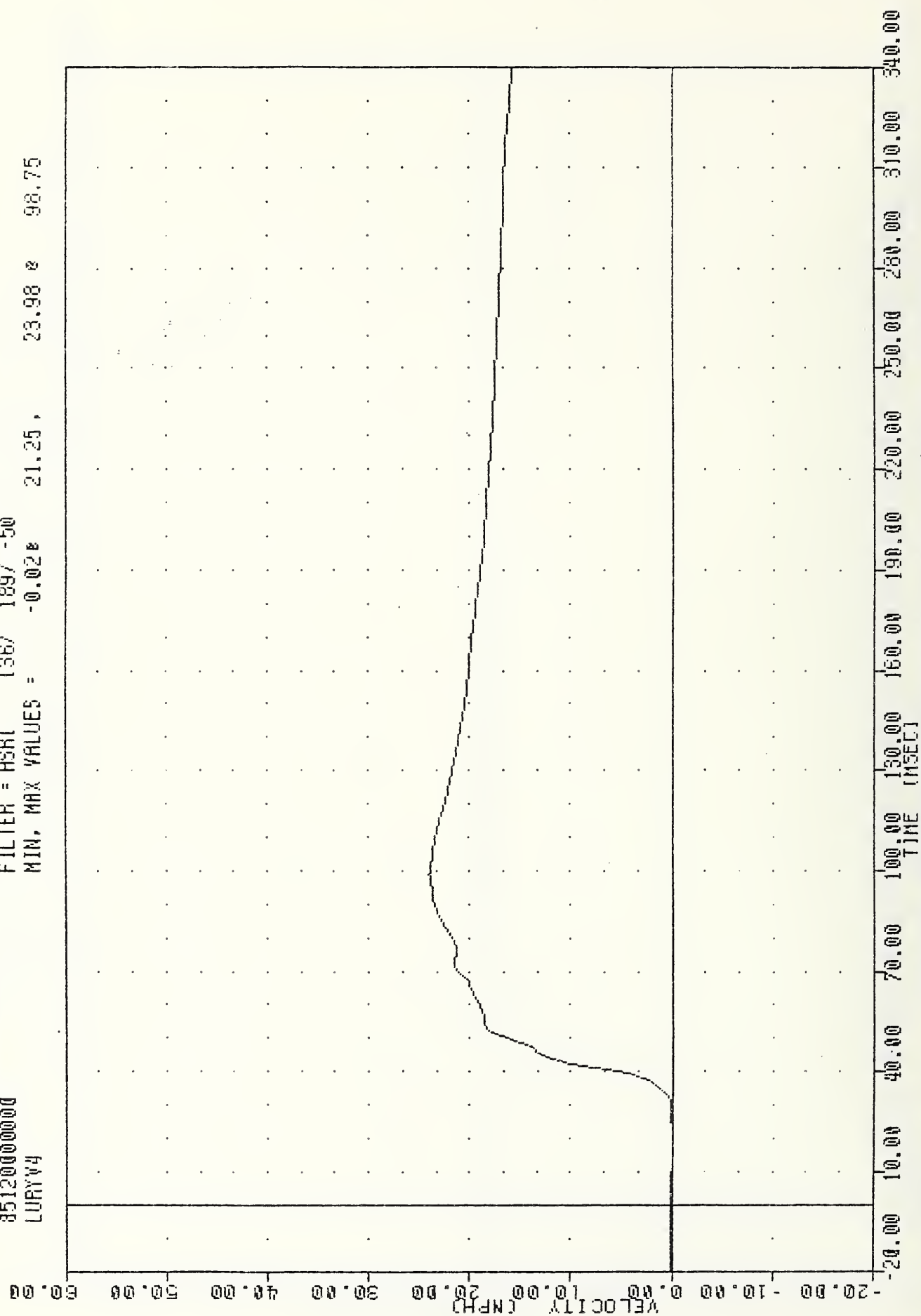
MIN, MAX VALUES = -4.72g 116.88g 91.02g 41.25g

ACCELERATION [G]



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

VRT , 850430  
 31 PROTECTION FROM VEH  
 85120000000  
 LURYV4  
 PLOT DATE 17-JUN-85 14:29:23  
 FILTER = HSRL 136/ 189/ -50  
 MIN, MAX VALUES = -0.02 21.25, 23.98 98.75



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING LURYV4

VRT ., 850430  
SI PROTECTION PROD VEH  
851200000000  
LURY6D

PLOT DATE 9-MAY-85 10:25:49

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -8.18e 73.75, 90.78 e 41.25

200.00

150.00

100.00

50.00

0.00

-50.00

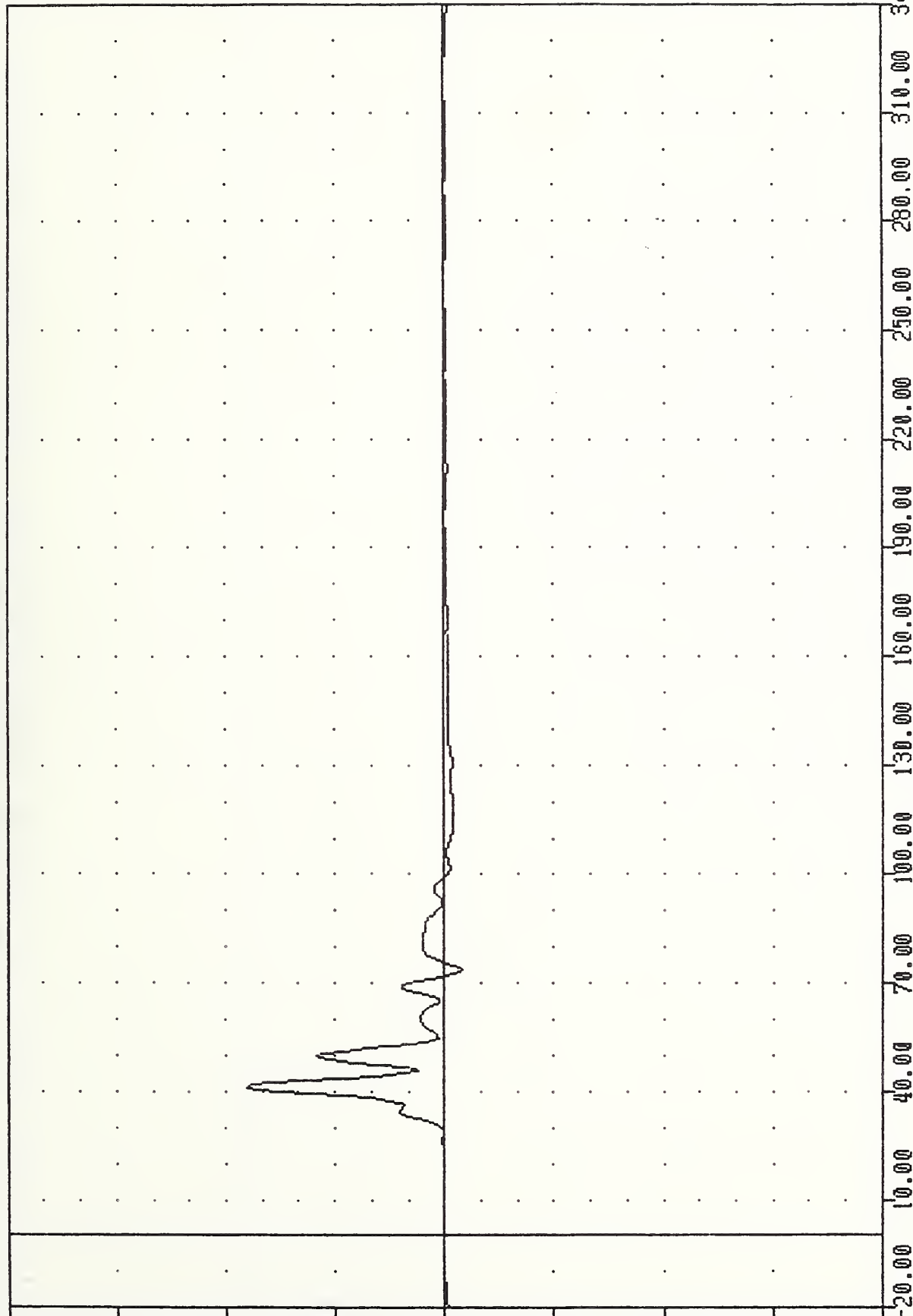
-100.00

-150.00

-200.00

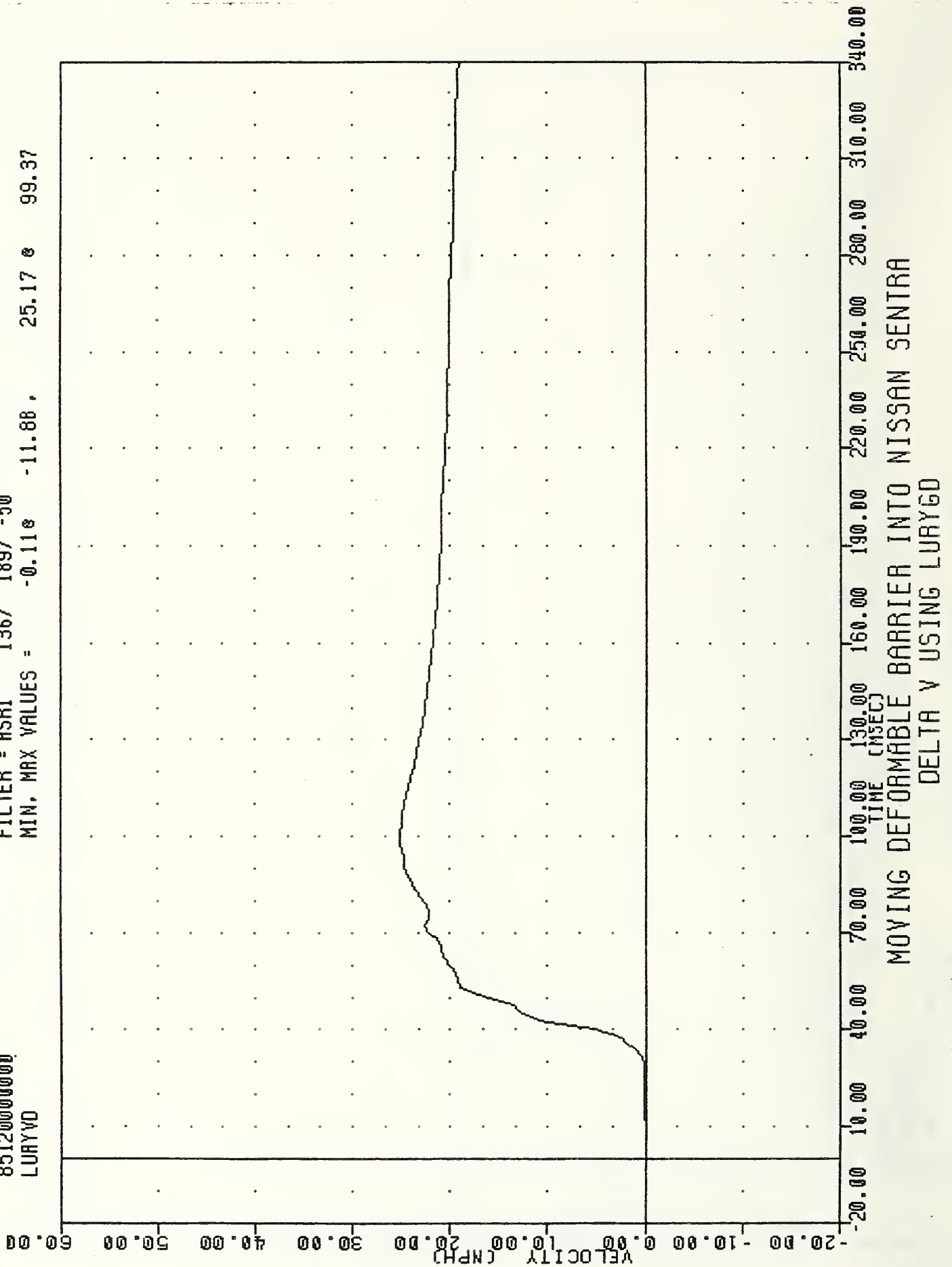
B-55

ACCELERATION (G)

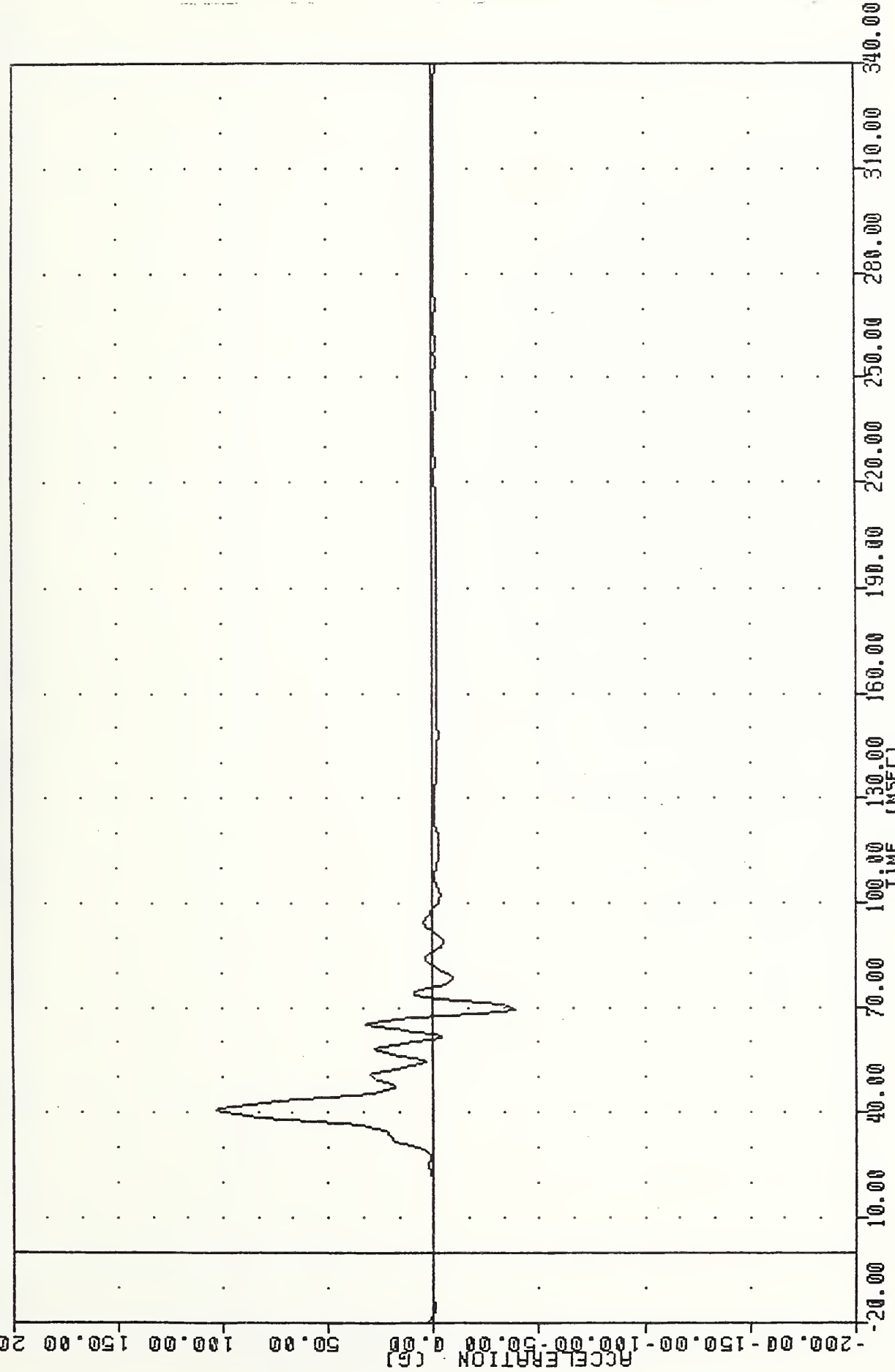


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER LEFT UPPER RIB ACCELERATION #2 Y AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LURYVD  
 PLOT DATE 9-MAY-85 10:27:48  
 FILTER = HSRI 136/ 189/ -50  
 MIN, MAX VALUES = -0.118 -11.88, 25.17 99.37

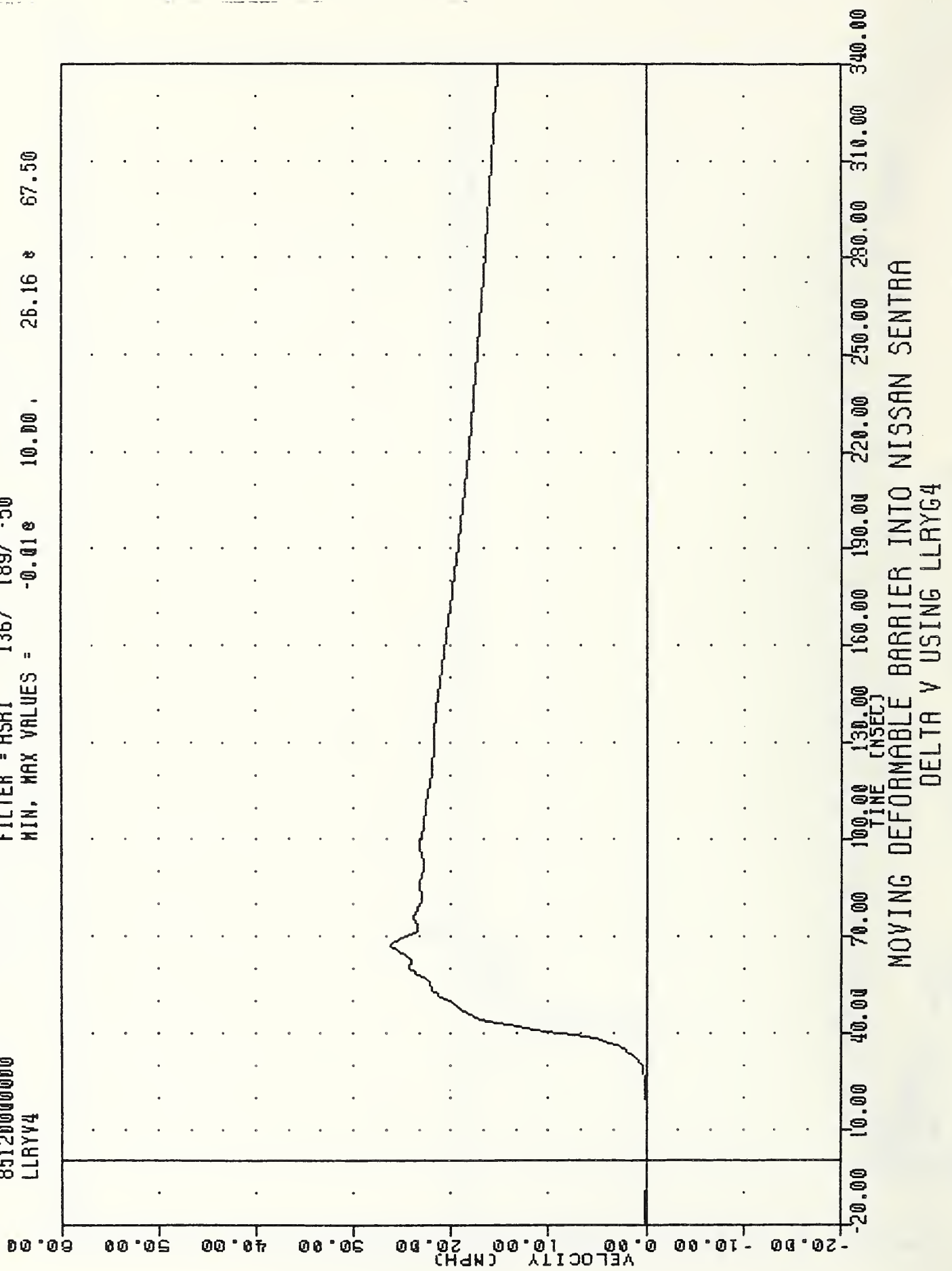


VRT . , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 LLRYG4  
 PLOT DATE 9-MAY-85 10:25:49  
 FILTER = HSR1 136/ 189/ -50  
 MIN, MAX VALUES = -38.59g 69.38 , 103.07 g 40.63



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 LLRYV4  
 FILTER = HSRI 136/ 189/ -50  
 MIN. MAX VALUES = -0.01s 10.00 , 26.16 s 67.50  
 PLOT DATE 9-MAY-85 10:27:48

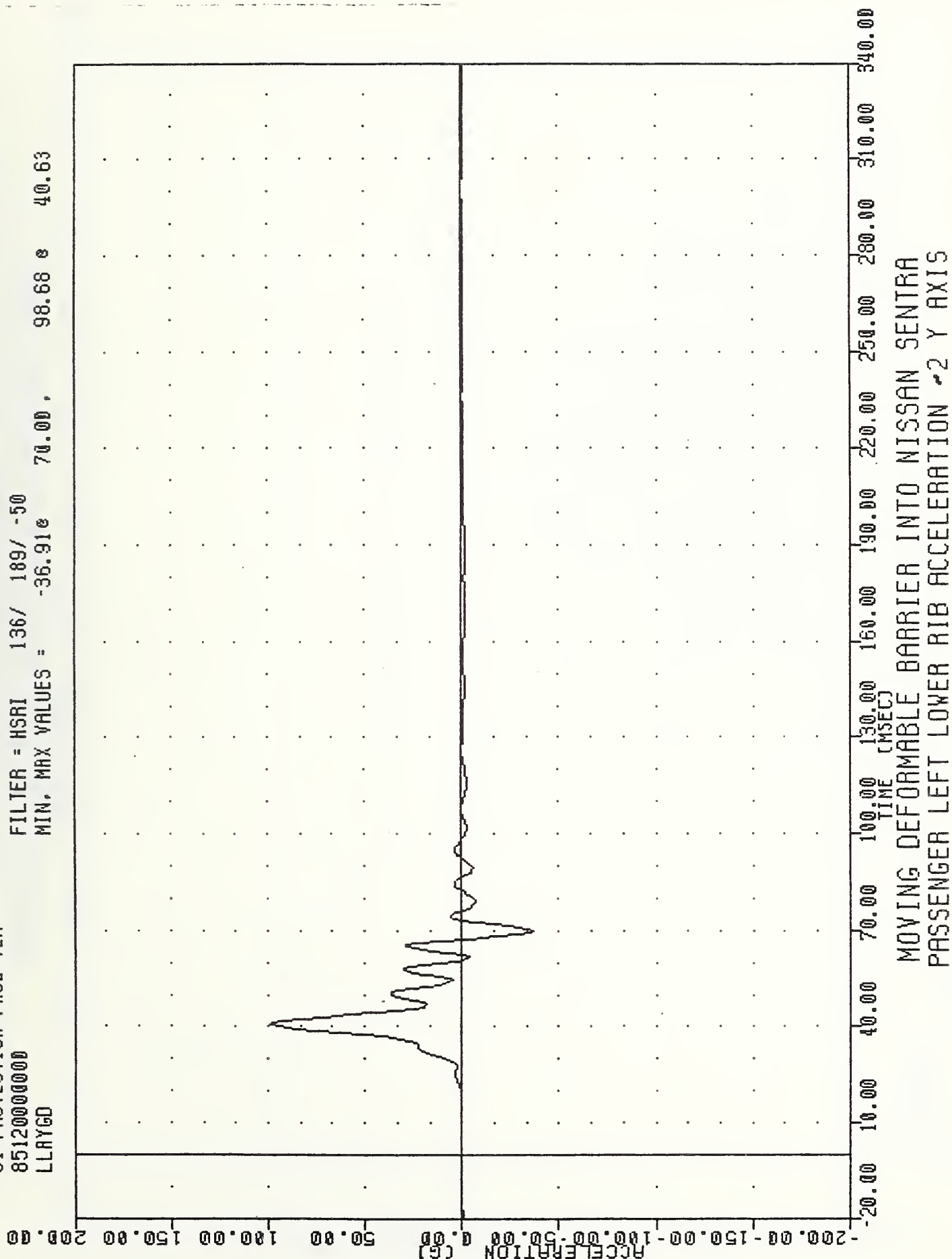


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING LLRYG4

PLOT DATE 9-MAY-85 10:25:49

VRT ., 850430  
SI PROTECTION PROD VEH  
851200000000  
LLAYGD

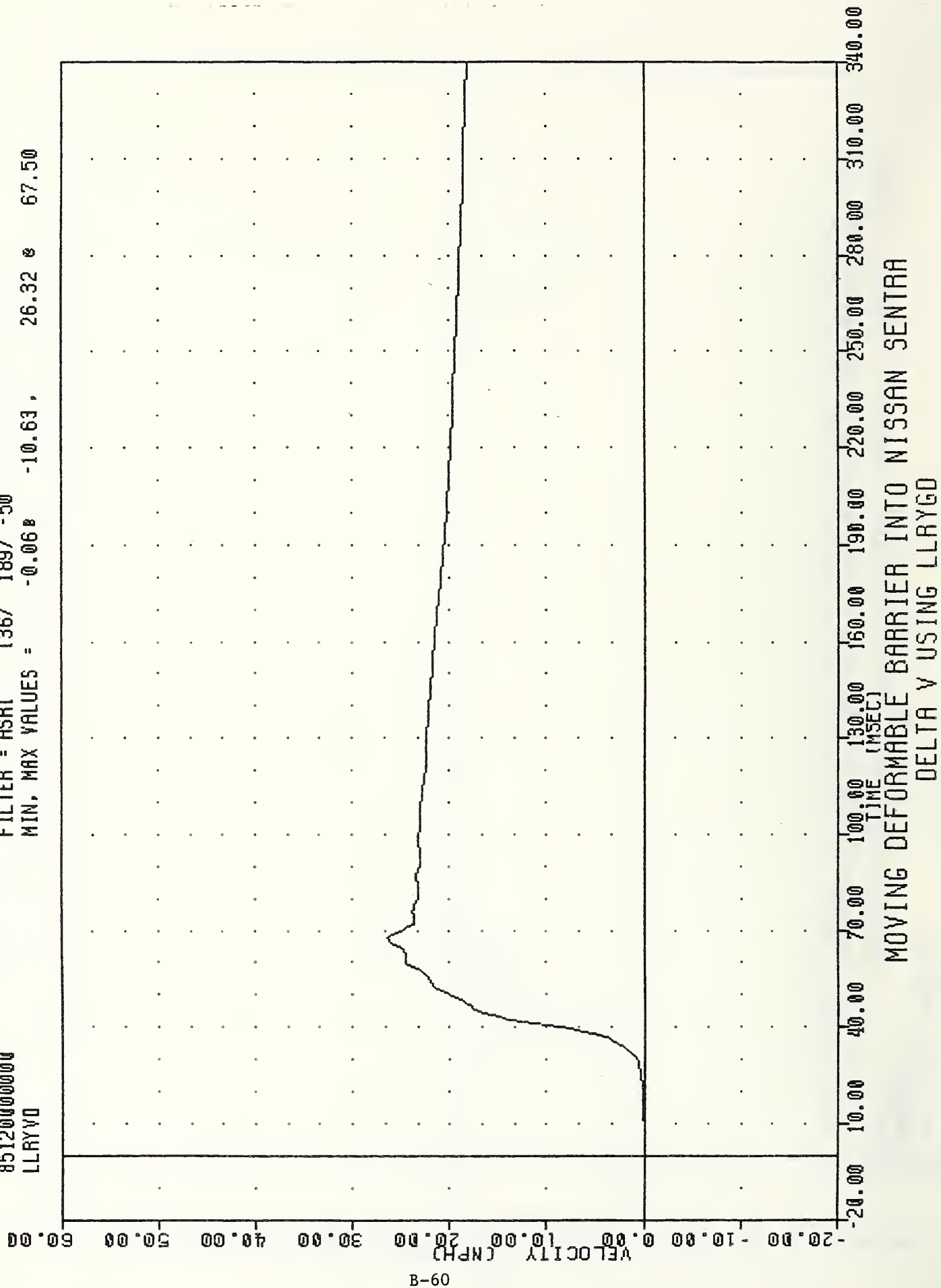
FILTER = HSRI 136/ 189/ -50  
MIN. MAX VALUES = -36.91e 70.00, 98.68 e 40.63



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER LEFT LOWER RIB ACCELERATION -2 Y AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LLRYV0

PLOT DATE 9-MAY-85 10:27:48  
 FILTER = HSR1 136/ 189/ -50  
 MIN, MAX VALUES = -0.068 -10.63, 26.32 0 67.50



VAT . . 850430 PLOT DATE 9-MAY-85 10:28:49

SI PROTECTION PROD VEH

851200000000

LATY04

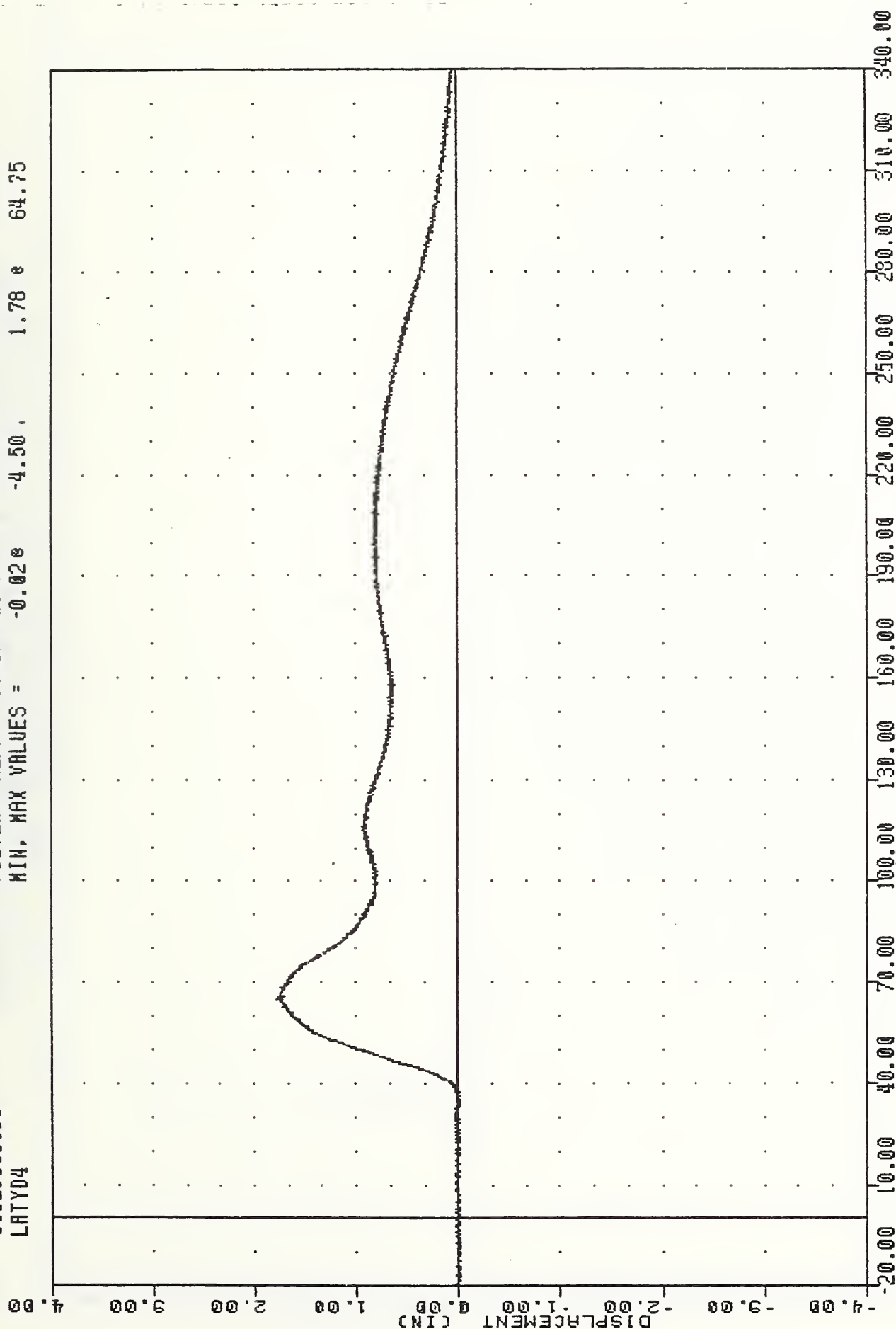
FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -0.02e

-4.50,

1.78 e

64.75

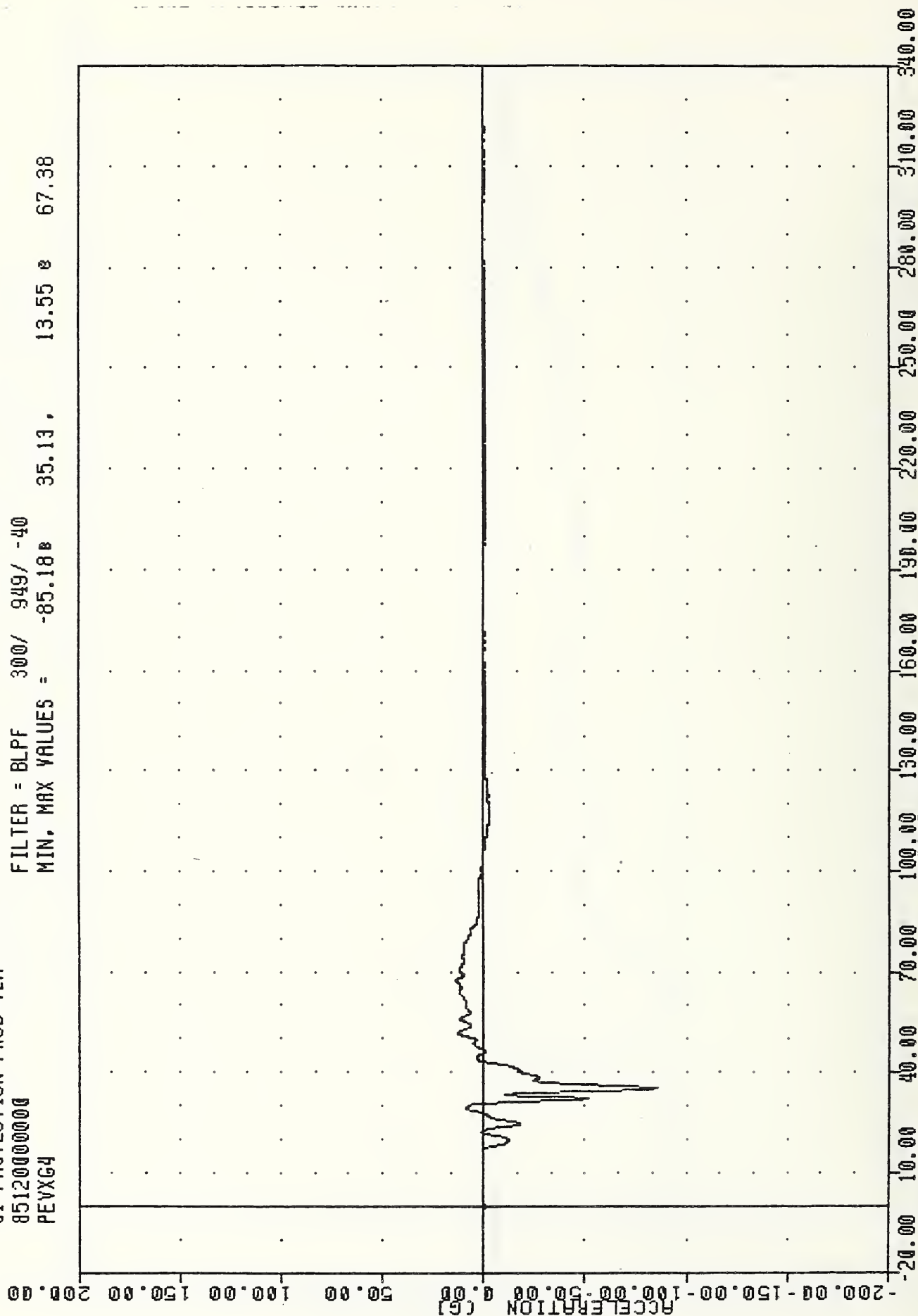


VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
PEVXG4

PLOT DATE 9-MAY-85 10:28:49

FILTER = BLPF 300/ 949/ -40

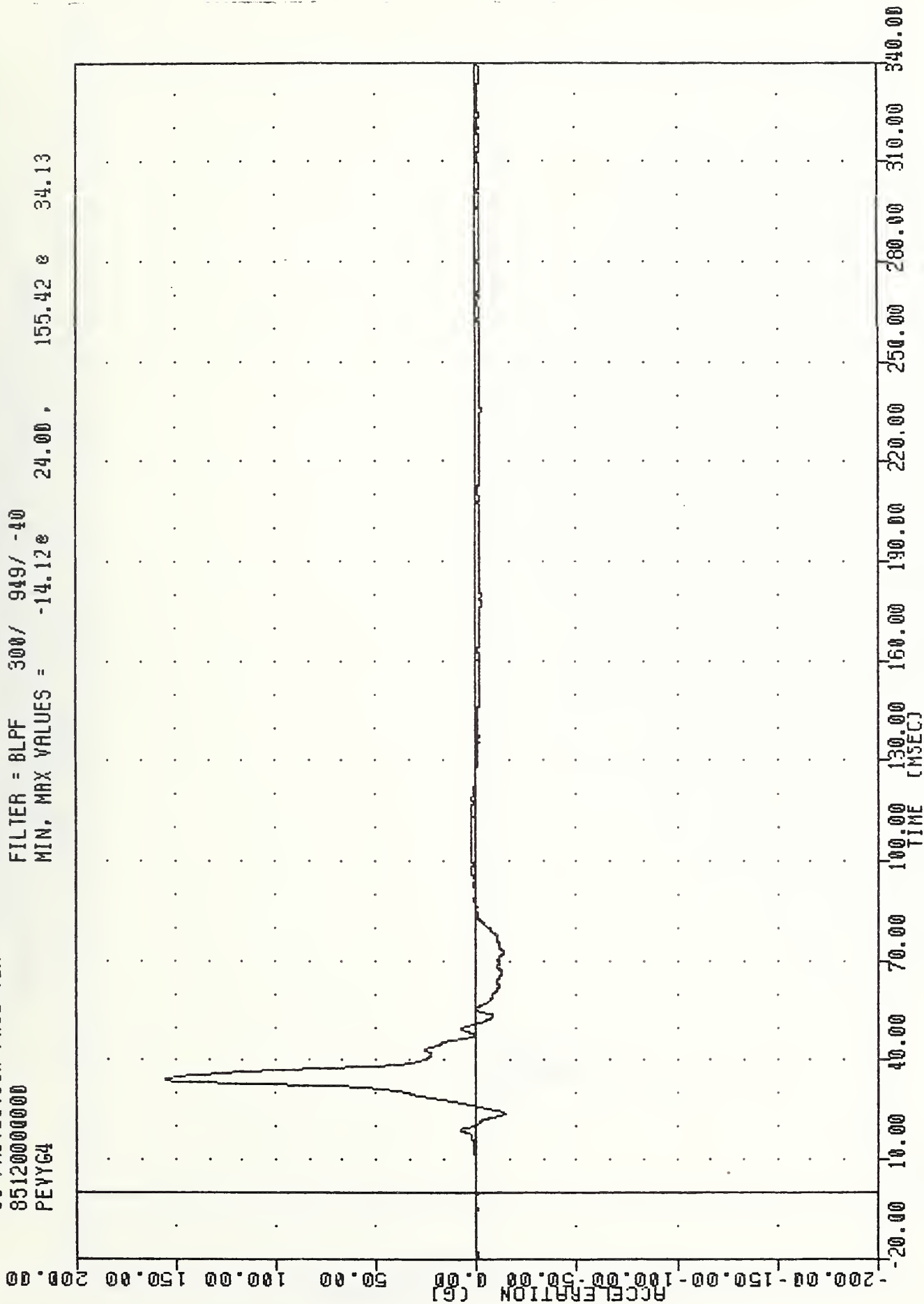
MIN, MAX VALUES = -85.18 35.13, 13.55 67.38



PLOT DATE 9-MAY-85 10:28:49

VRT . . . 850430  
SI PROTECTION PROD VEH  
851200000000  
PEY64

FILTER = BLPF 300/ 949/ -40  
MIN, MAX VALUES = -14.12e 24.00, 155.42 e 34.13

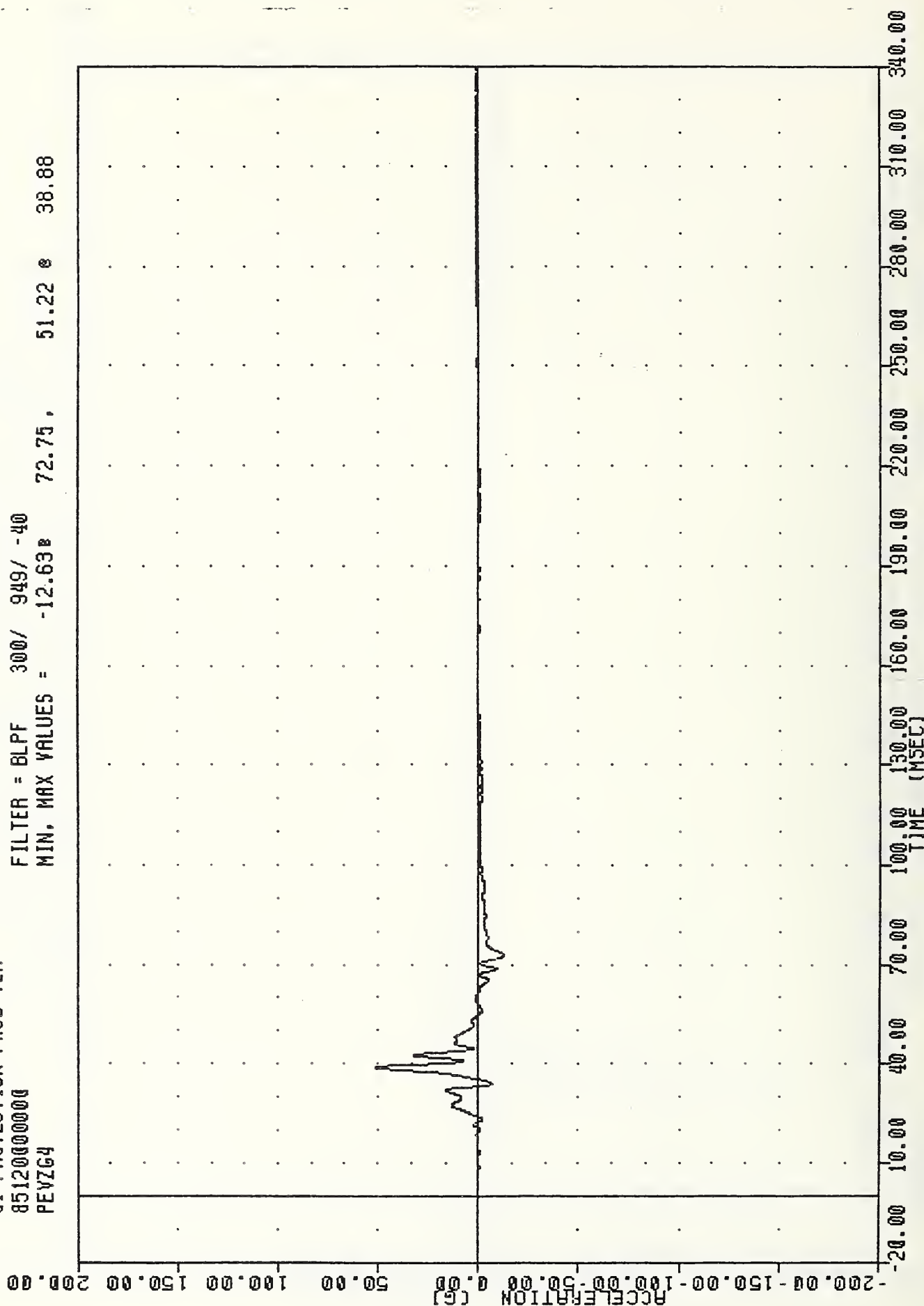


PLOT DATE 9-MAY-85 10:28:49

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
PEVZG4

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -12.63 72.75, 51.22 38.88



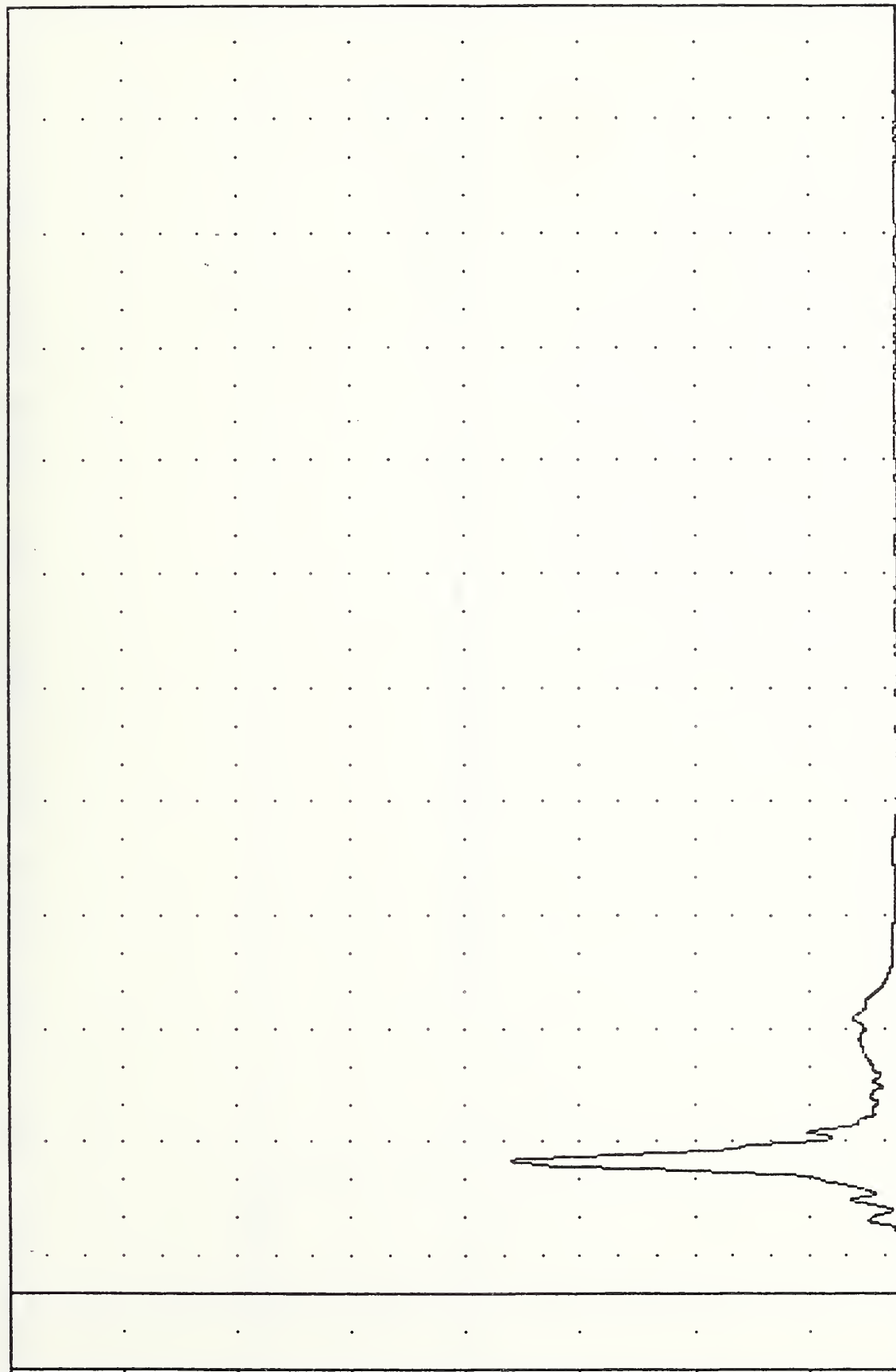
VRT . . 850430  
SI PROTECTION PROD VEH  
851200000000  
PEVRG4

PLOT DATE 9-MAY-85 10:28:49

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.07e -14.00, 170.02 e 34.88

ACCELERATION (G)



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
PASSENGER PELVIS RESULTANT

PLOT DATE 9-MAY-85 10:28:49

VAT , 850430  
SI PROTECTION PROD YEH

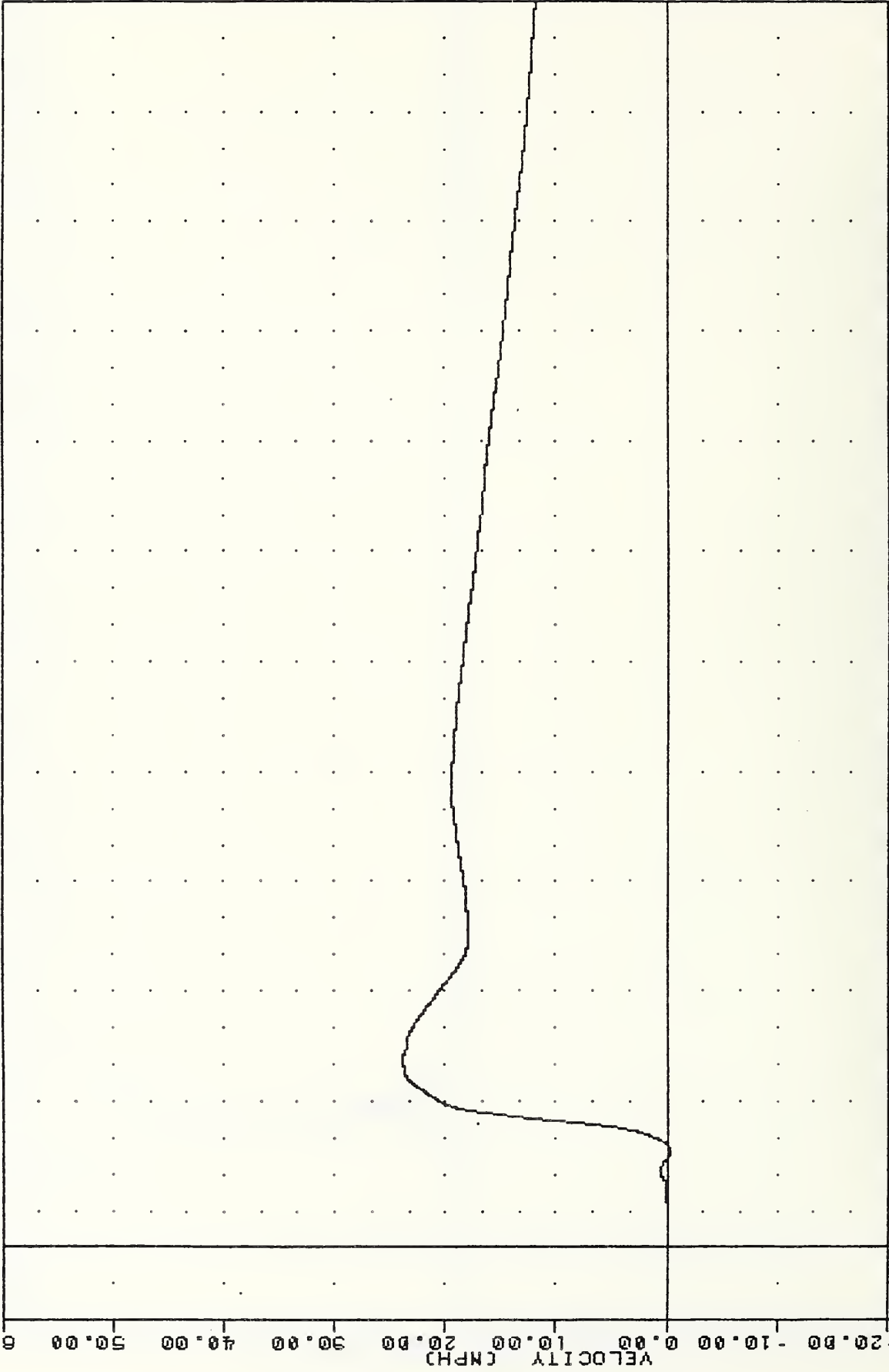
FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.35 26.25 23.90 51.00

85120000000  
PEVYV4

60.00  
50.00  
40.00  
30.00  
20.00  
10.00  
0.00  
-10.00  
-20.00

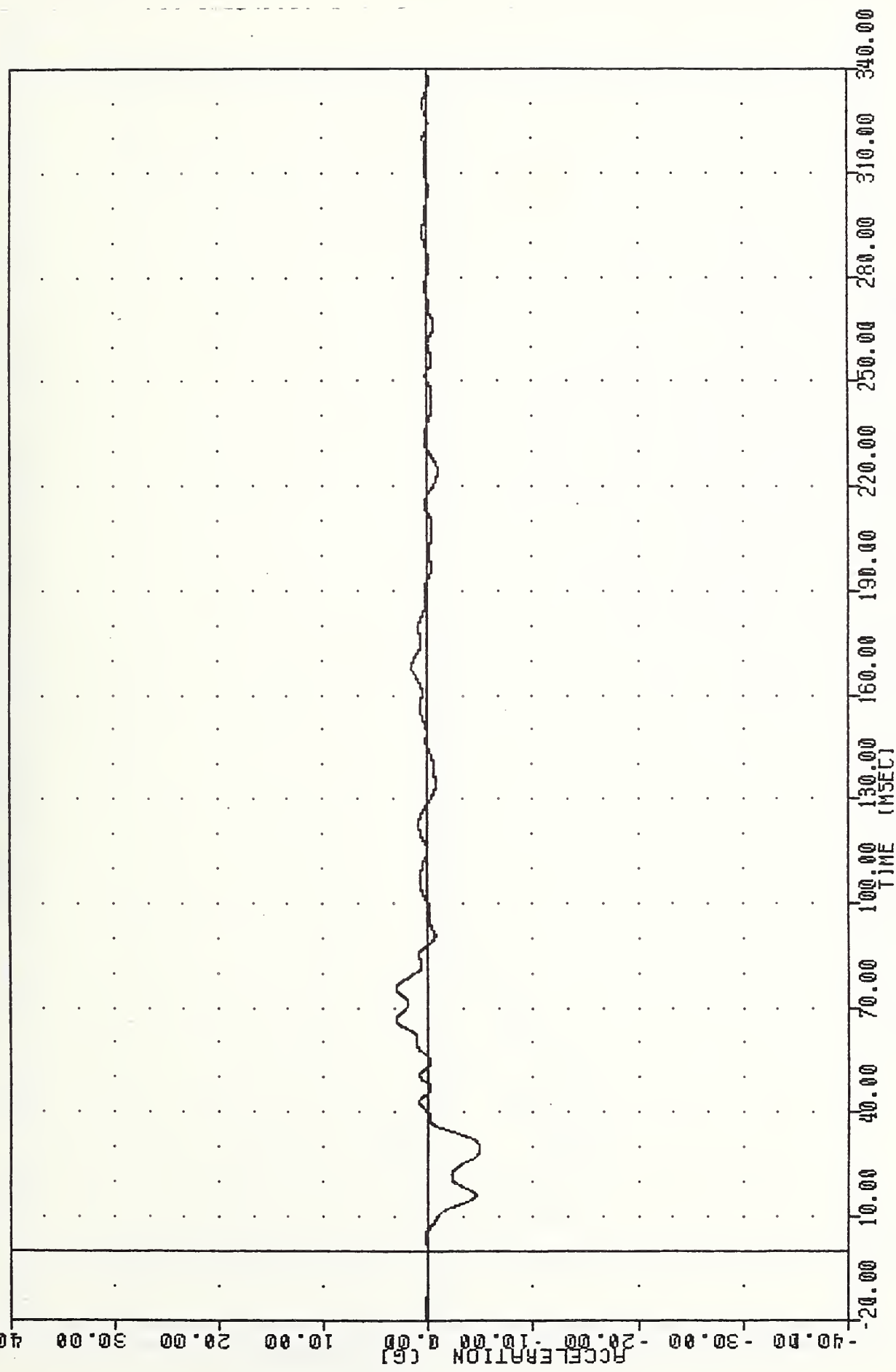
B-66



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING PEVYV4

VRT ., 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 RFSXG  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = BLPF 100/ 316/ -40  
 MIN. MAX VALUES = -4.83 29.63, 3.11 66.63



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE RIGHT FRONT SILL ACCELERATION X AXIS

VRT , 850430 9-MAY-85 10:40:19

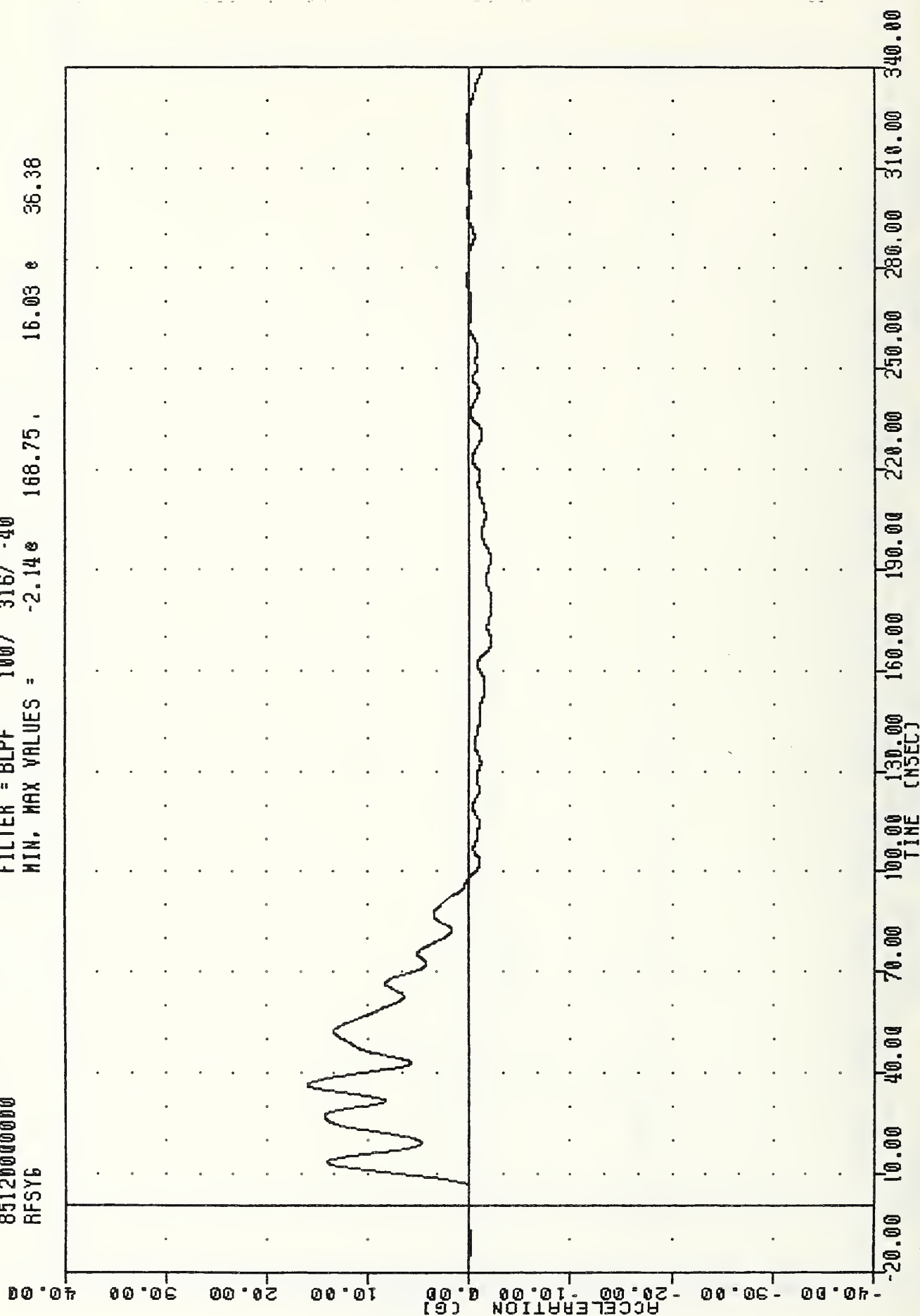
SI PROTECTION PROD VEH

851200000000

RFSY6

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -2.14e 168.75, 16.03 e 36.38



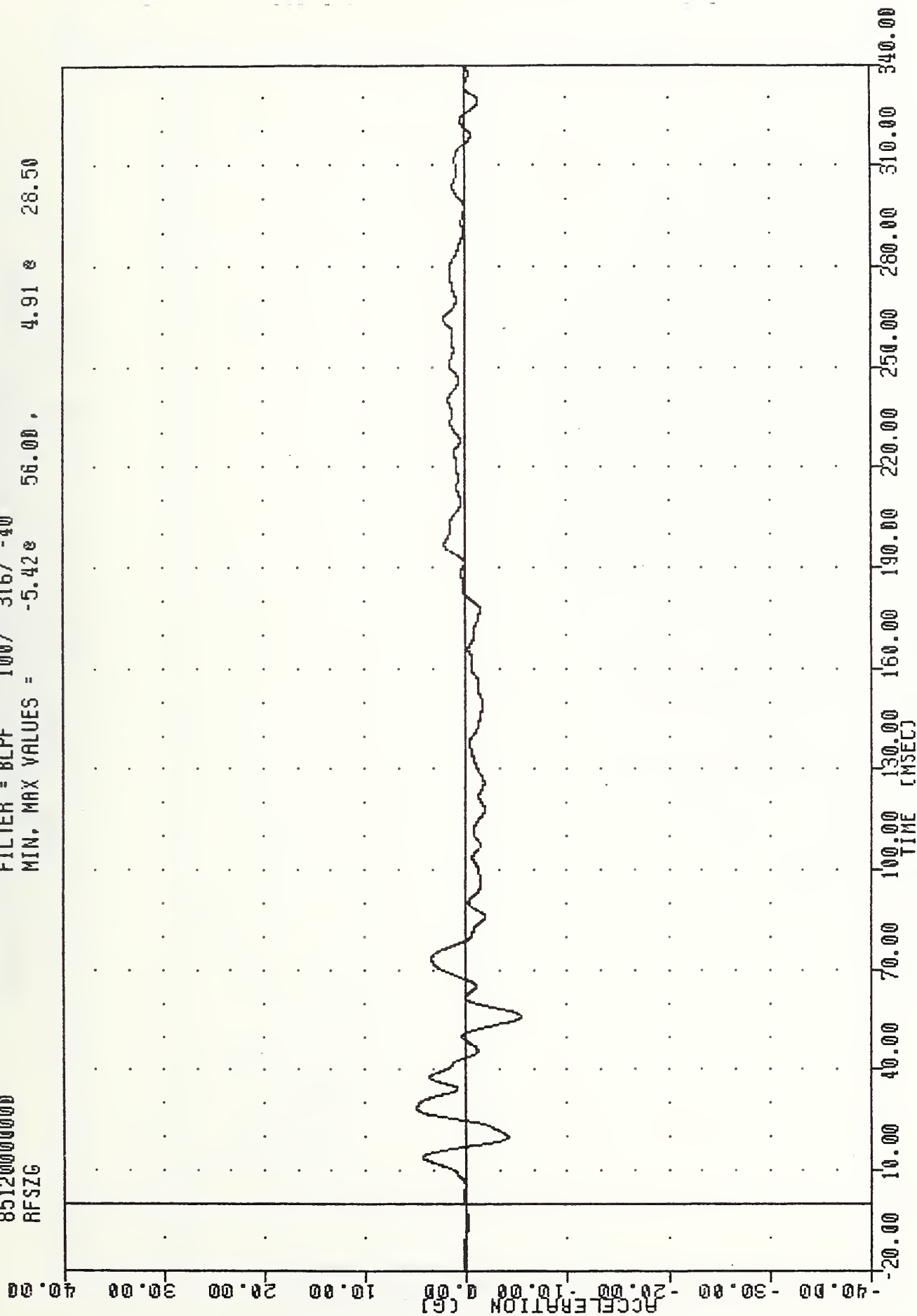
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

VRT 850430  
SI PROTECTION PROD VEH  
851200000000  
RFSZG

PLOT DATE 9-MAY-85 10:40:19

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -5.428 56.00, 4.918 28.50

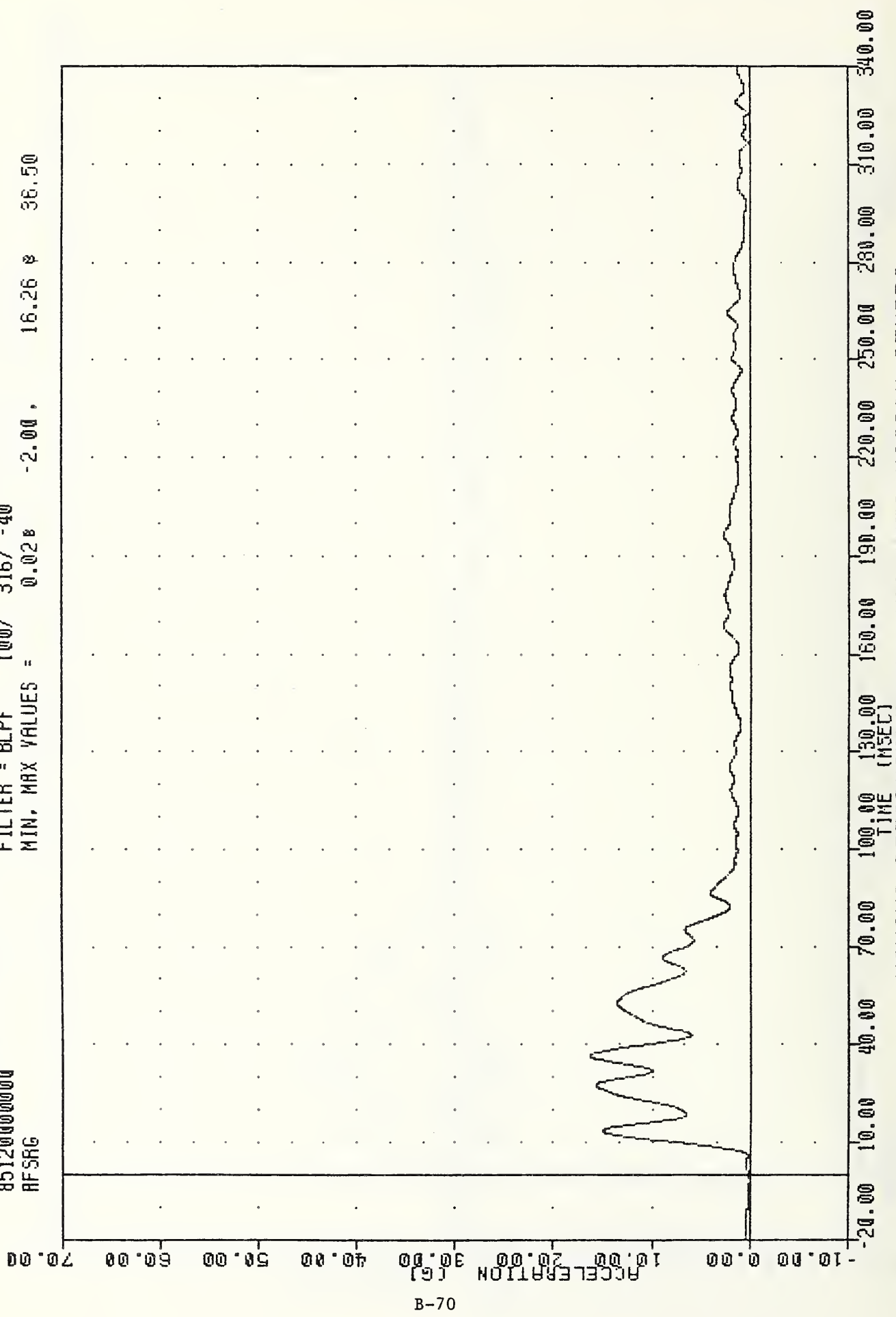


VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 RFSRG

PLOT DATE 9-MAY-85 10:42:04

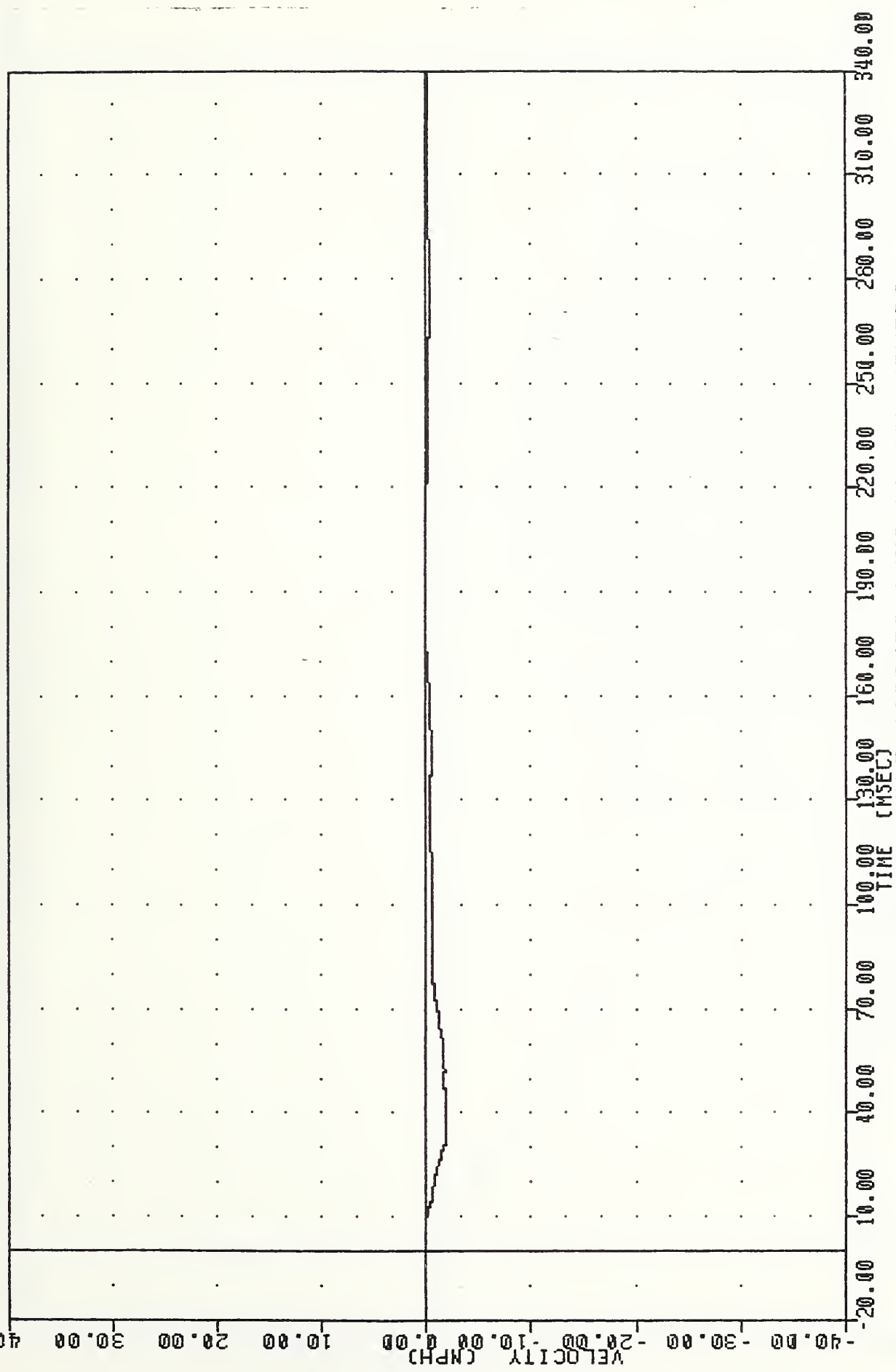
FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = 0.028 -2.00 16.26 36.50



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE RIGHT FRONT SILL RESULTANT

VRT ., 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 RFSXV  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = 8LPF 300/ 949/ -40  
 MIN, MAX VALUES = -1.88 37.88, 0.13 190.25



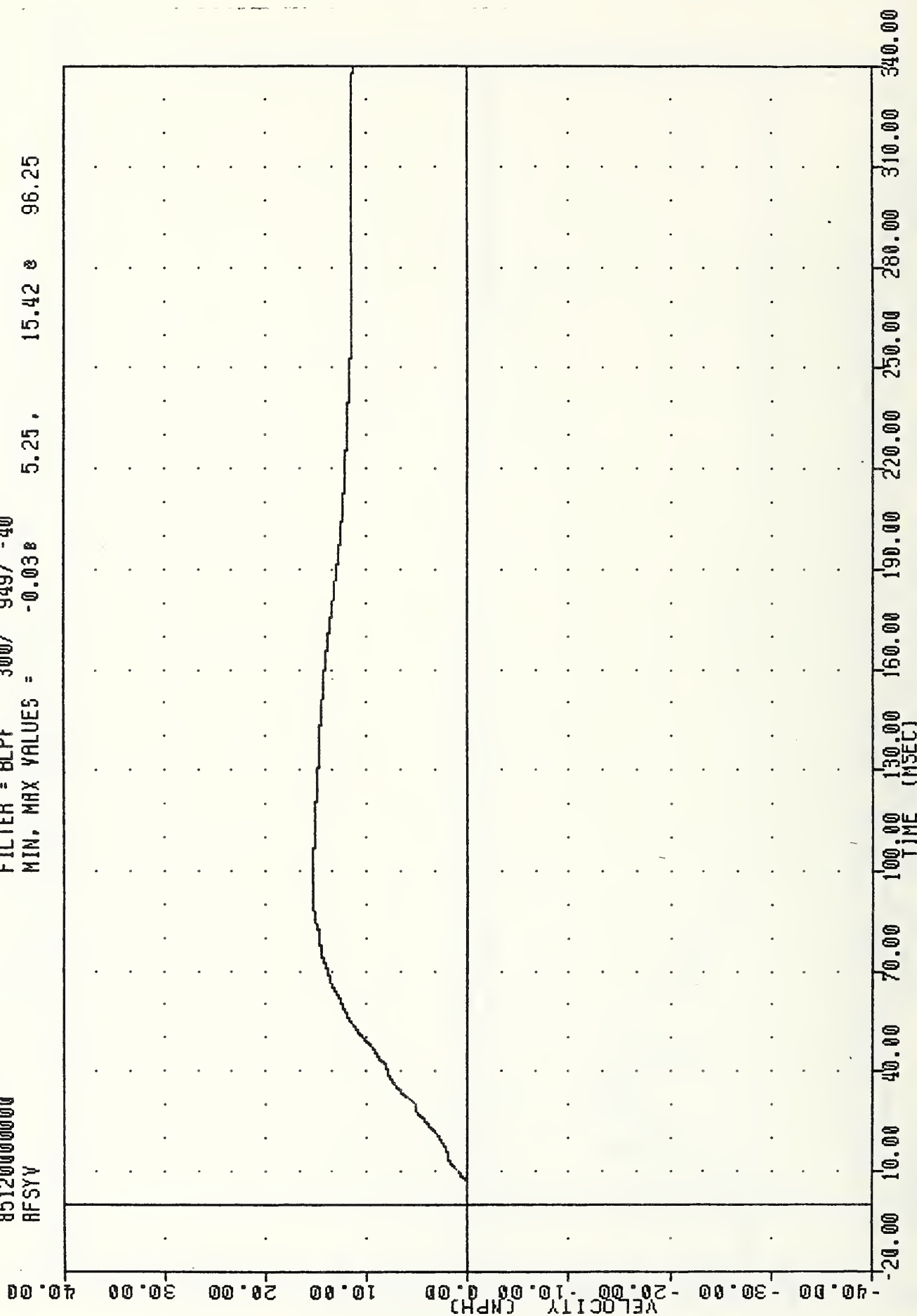
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING RFSXG

PLOT DATE 9-MAY-85 10:40:19

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
RFSYV

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.038 5.25, 15.42 @ 96.25



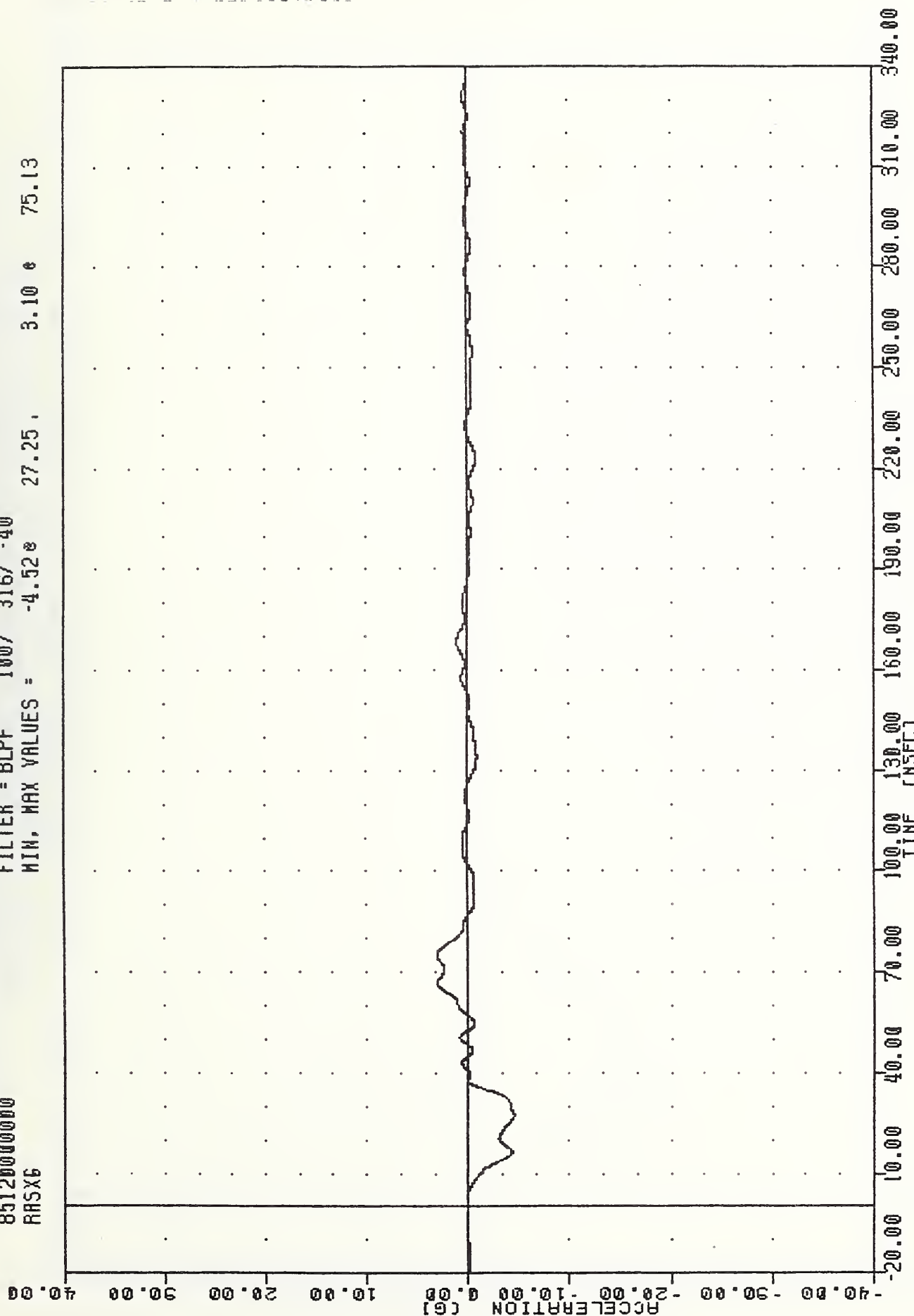
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING RFSYG

VAT ., 850430  
SI PROTECTION PROD VEH  
851200000000  
RAXXG

PLOT DATE 9-MAY-85 10:40:19

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -4.52e 27.25, 3.10 e 75.13



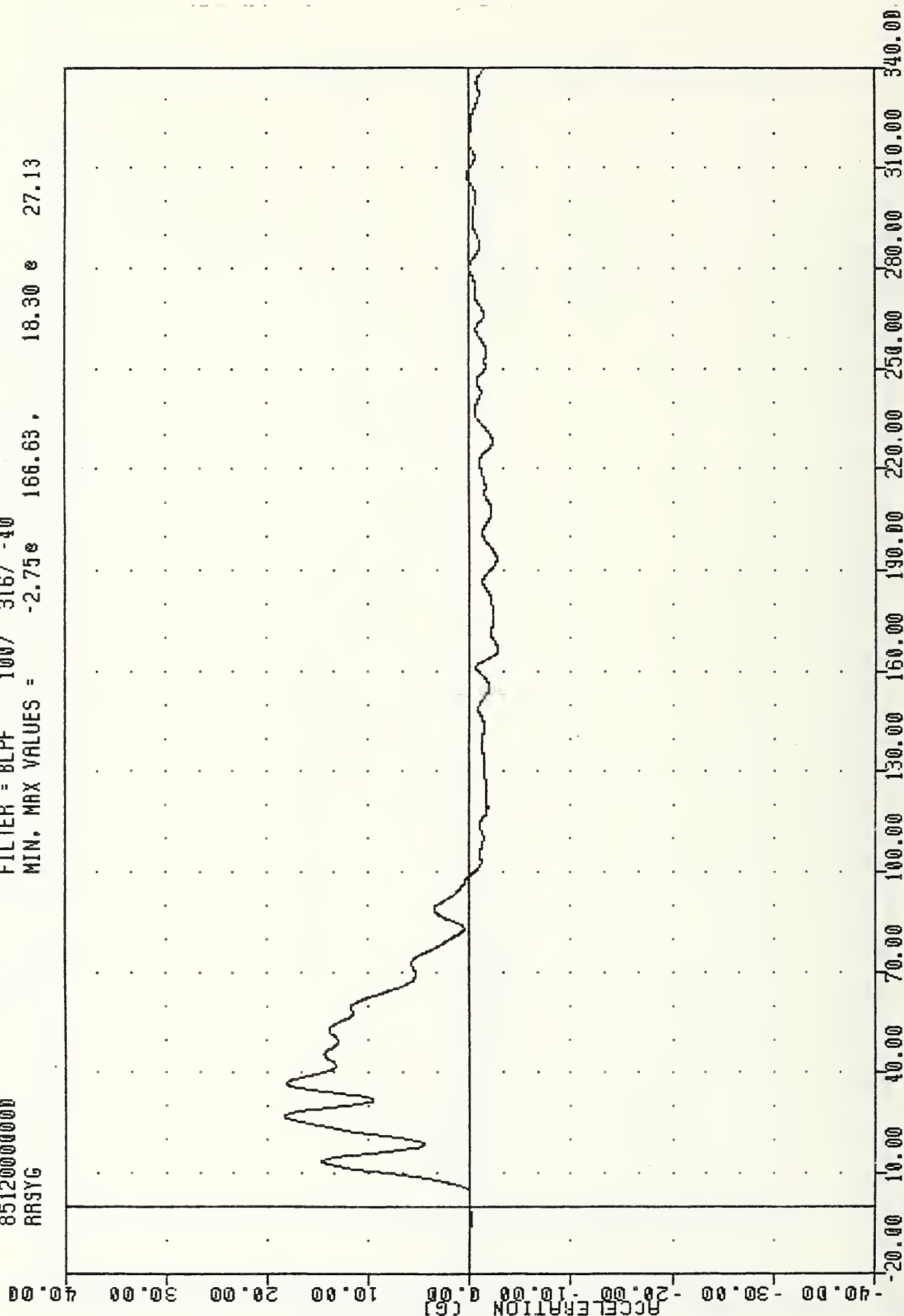
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS

PLOT DATE 9-MAY-85 10:40:19

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
RRSYG

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -2.75e 166.63, 18.30 e 27.13

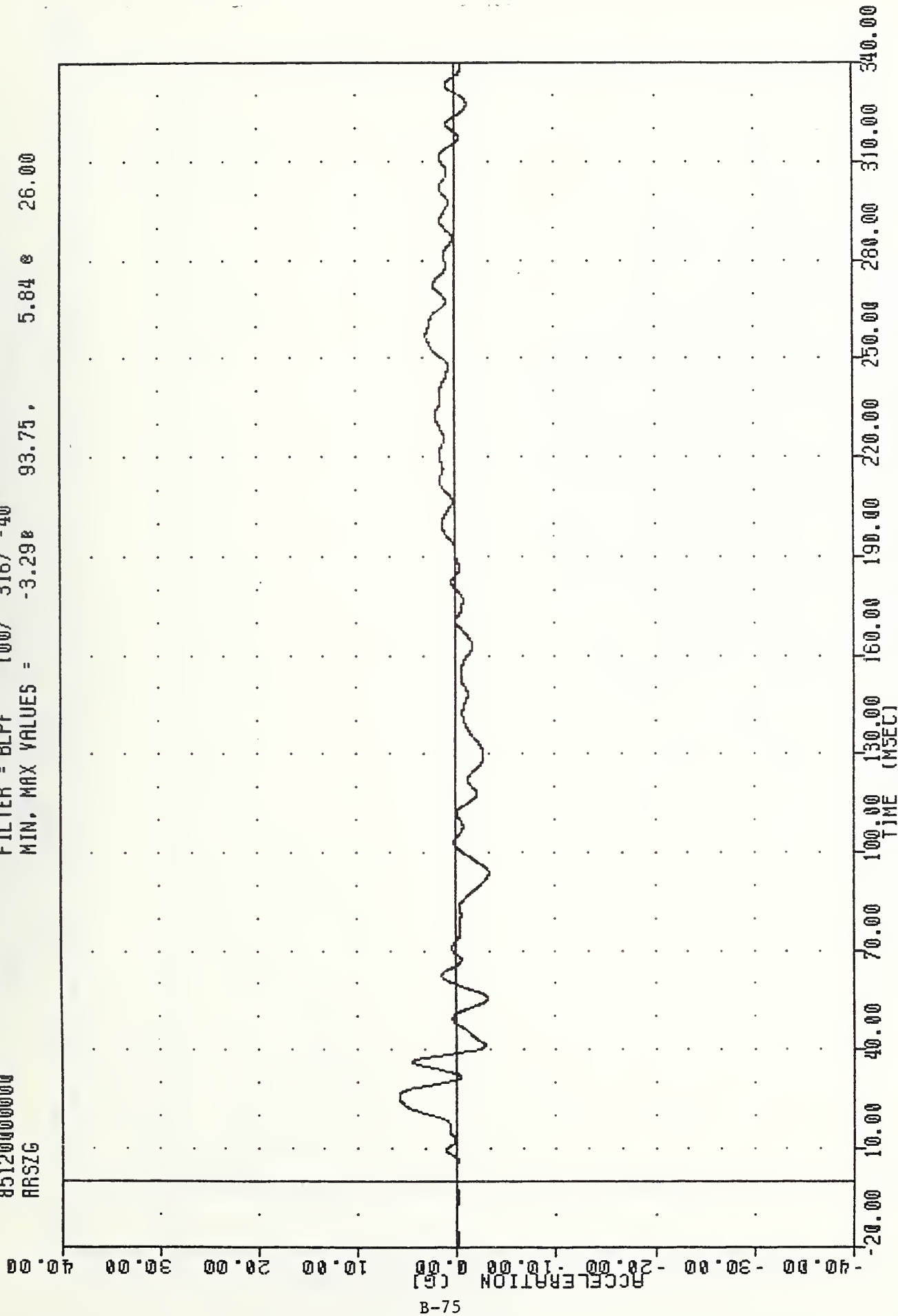


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

PLOT DATE 9-MAY-85 10:40:19

VRT . , 850430  
SI PROTECTION PROD VEH  
851200000000  
RRSZG

FILTER = BLPF 100/ 316/ -40  
MIN, MAX VALUES = -3.29 93.75, 5.84 26.00

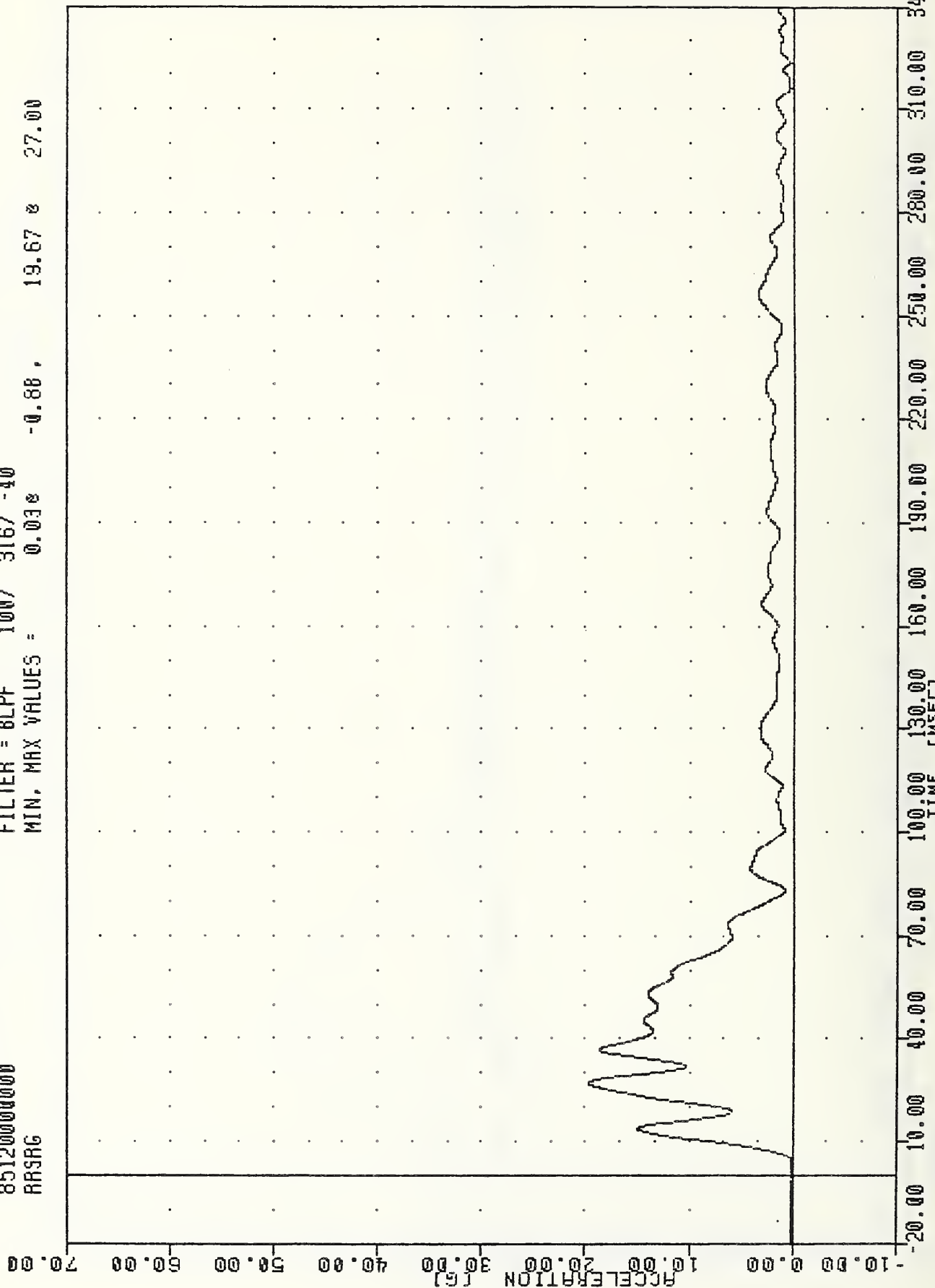


VRT , 850430  
 SI PROTECTION FROM VEH  
 851200000000  
 RR9RG

PLOT DATE 9-MAY-85 10:42:04

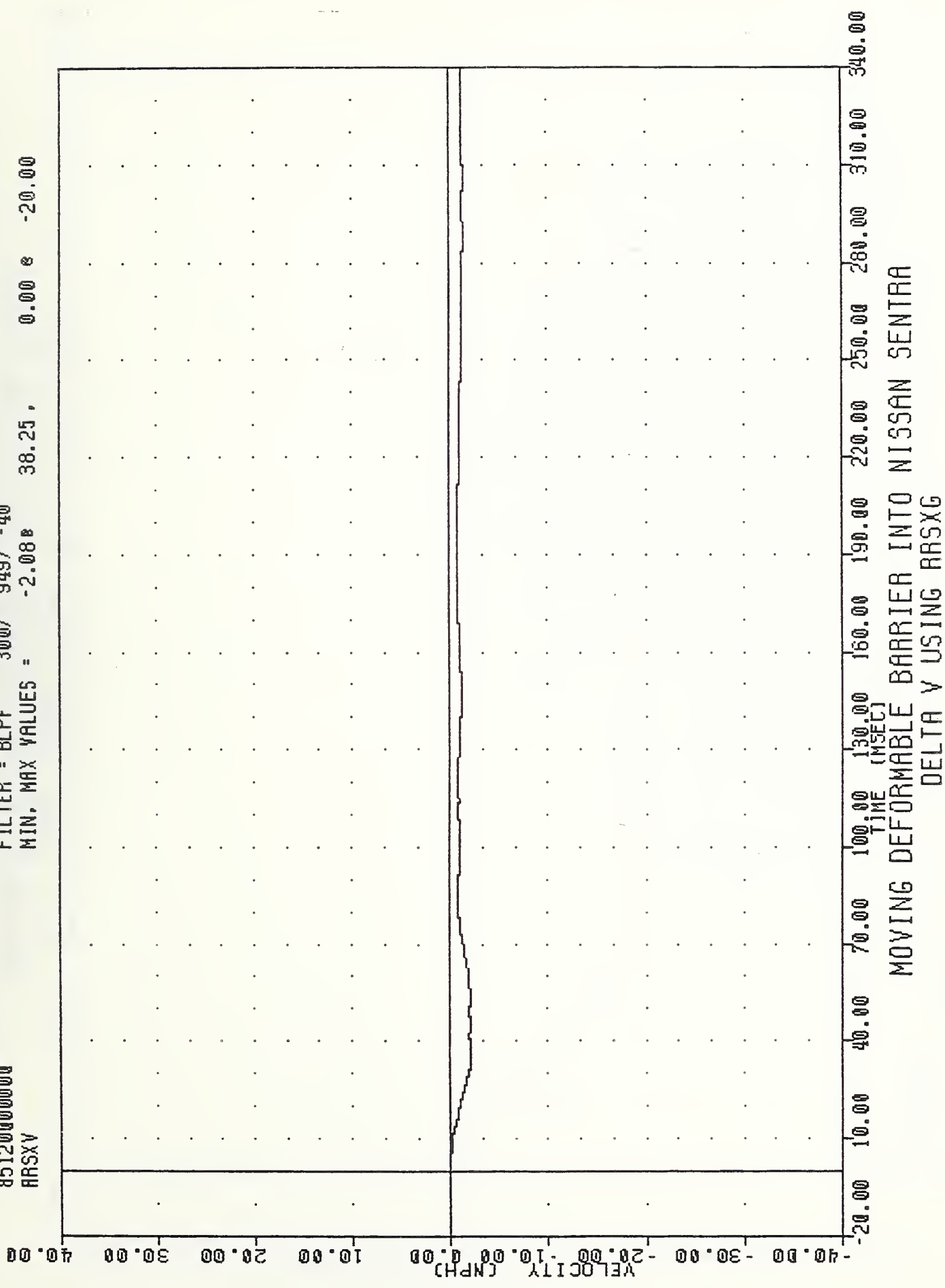
FILTER = 8LPF 100/ 316/ -40

MIN, MAX VALUES = 0.03g -0.88g 19.67g 27.00g



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE RIGHT REAR SILL RESULTANT

YRT . , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 ARSXV  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = BLPF 300/ 949/ -40  
 MIN. MAX VALUES = -2.08 38.25, 0.00 8 -20.00



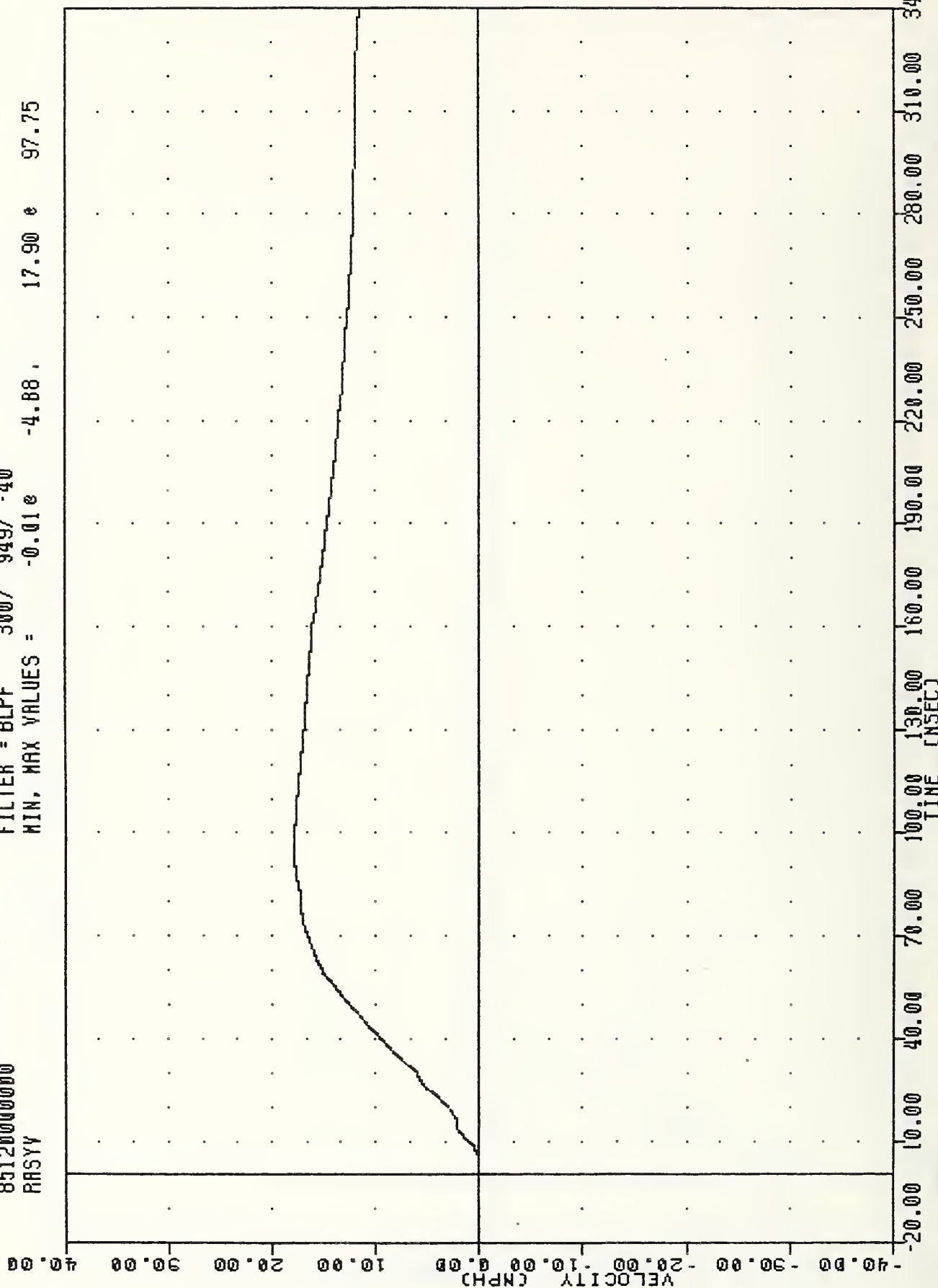
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING ARSXG

VAT , 850430  
SI PROTECTION PROD VEH  
851200000000  
RASYV

PLOT DATE 9-MAY-85 10:40:19

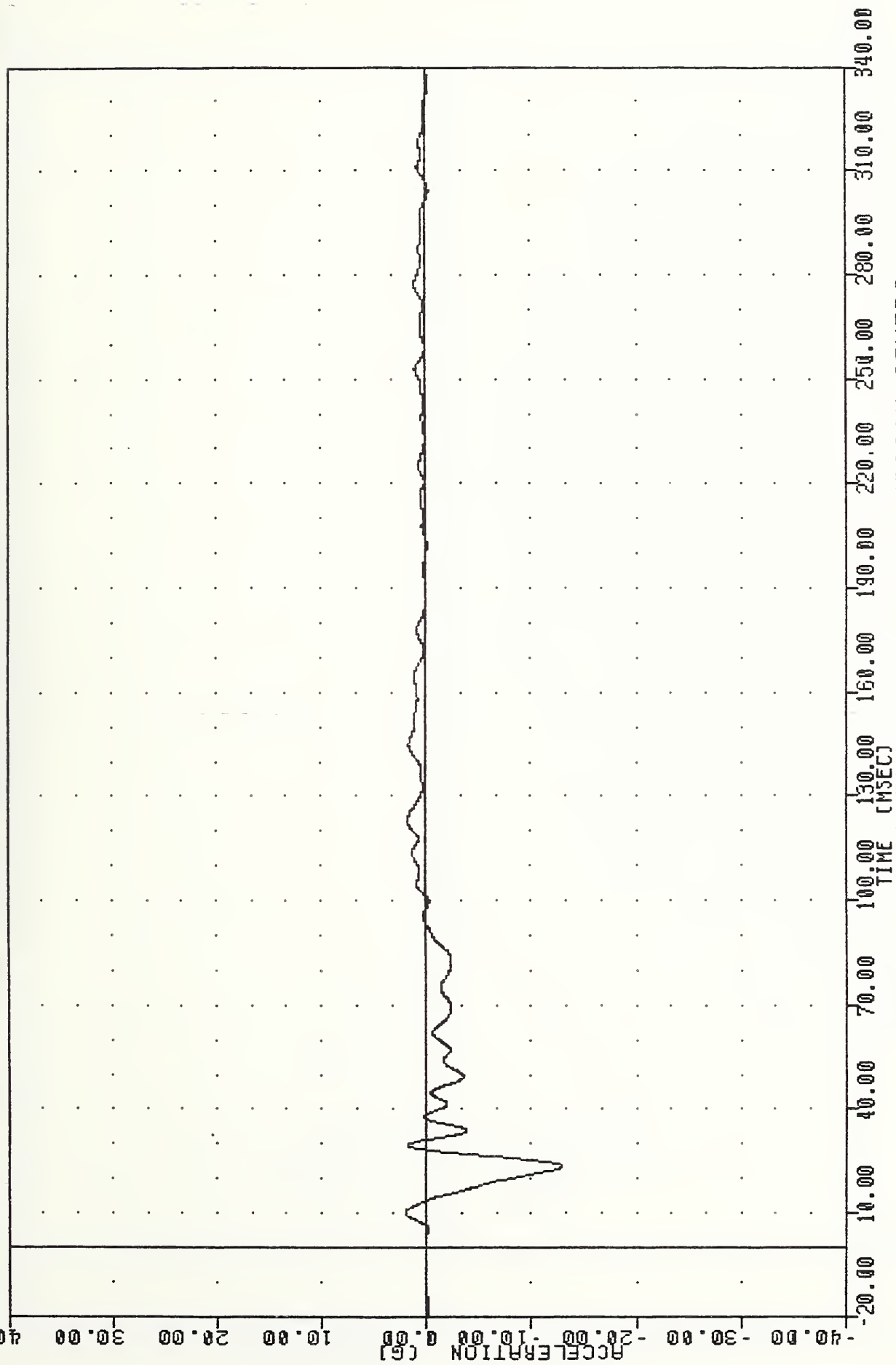
FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.01e -4.88 , 17.90 e 97.75



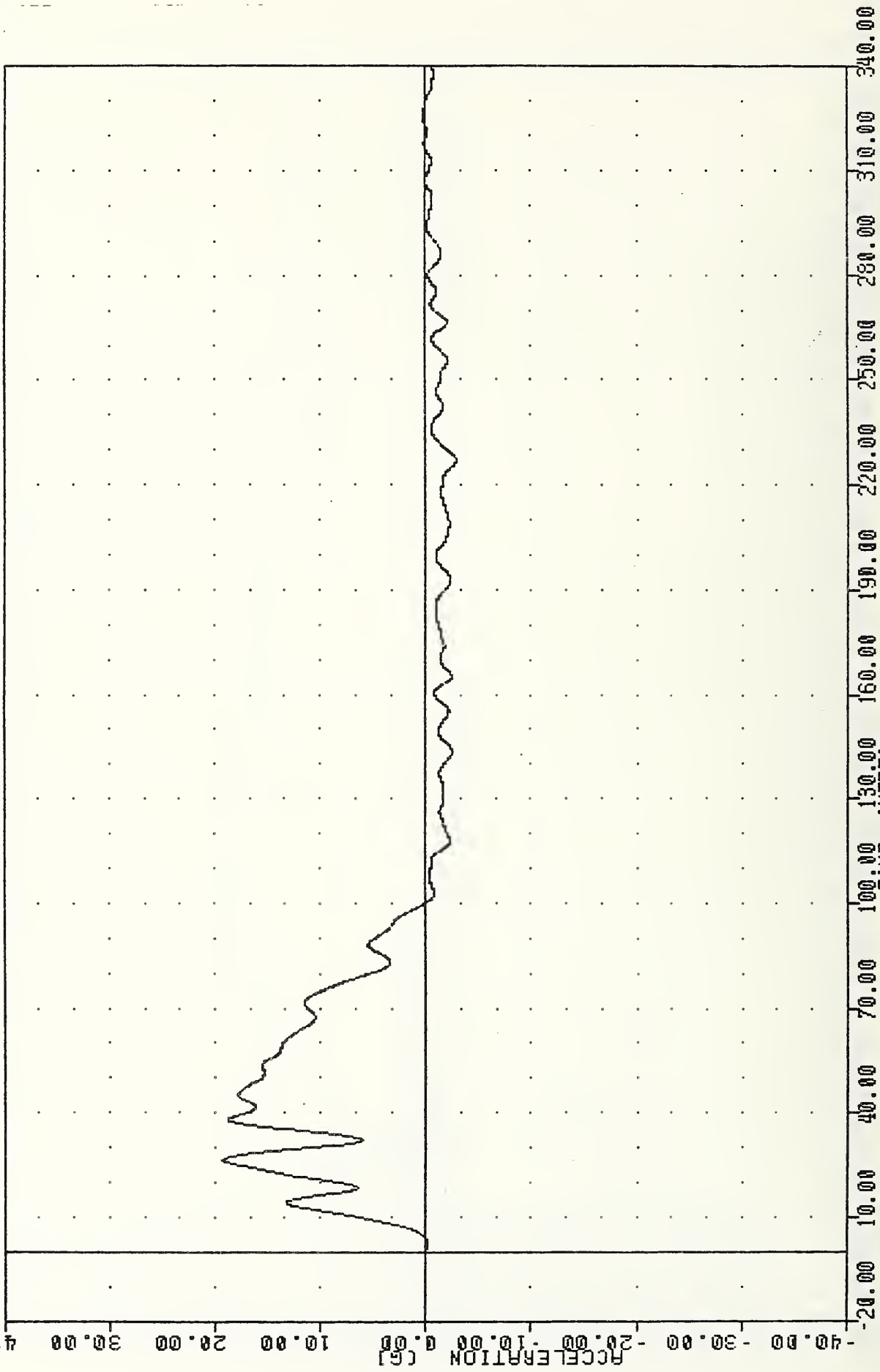
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING RASYG

VRI . , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 ROKXG  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = 8LPF 100/ 316/ -40  
 MIN. MAX VALUES = -12.91e 23.63, 2.04 e 10.38



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE REAR DECK ACCELERATION X AXIS

VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 ADKYG  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = BLPF 100/ 316/ -40  
 MIN, MAX VALUES = -2.88g 227.13, 19.28 g 26.50

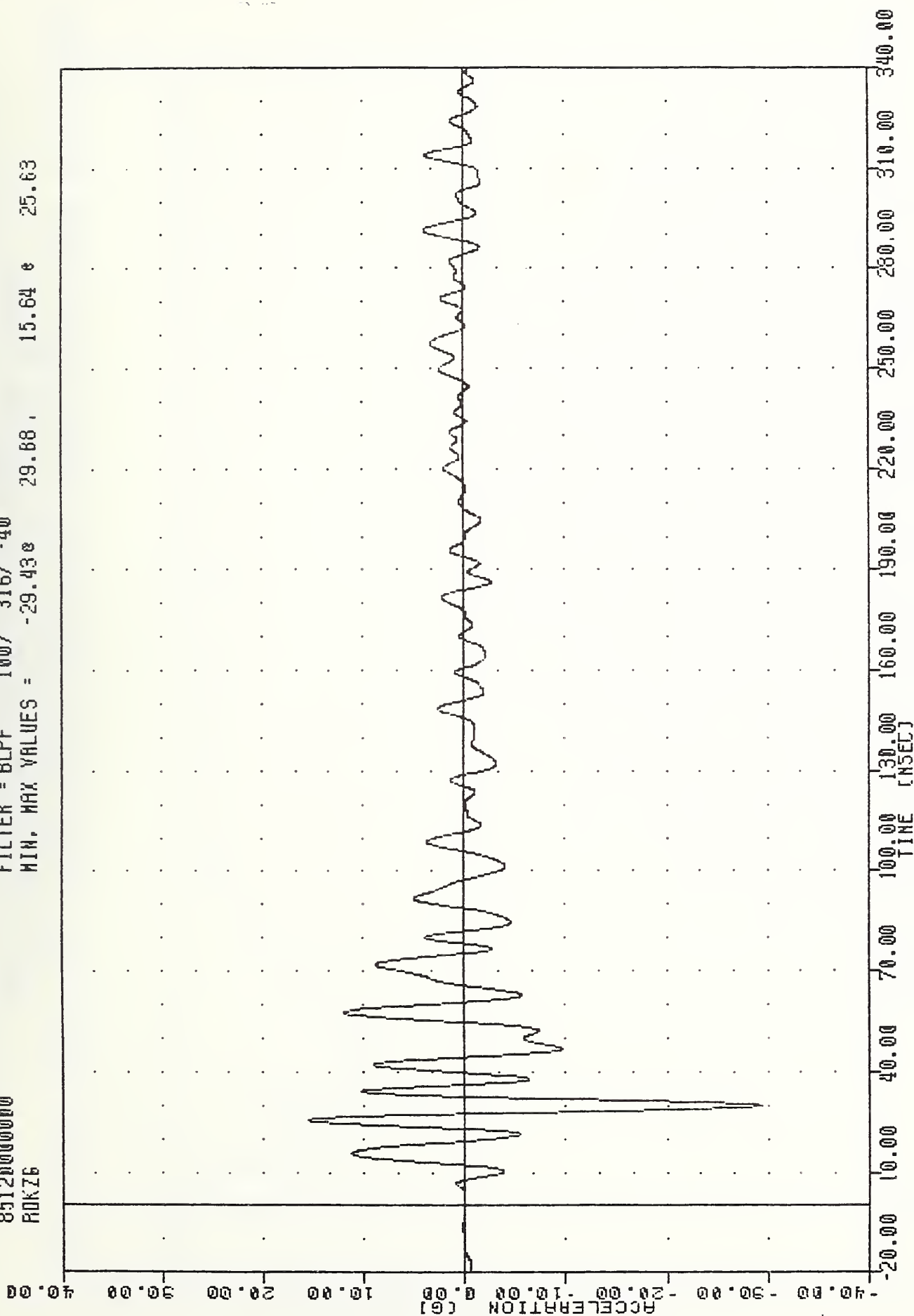


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE REAR DECK ACCELERATION Y AXIS

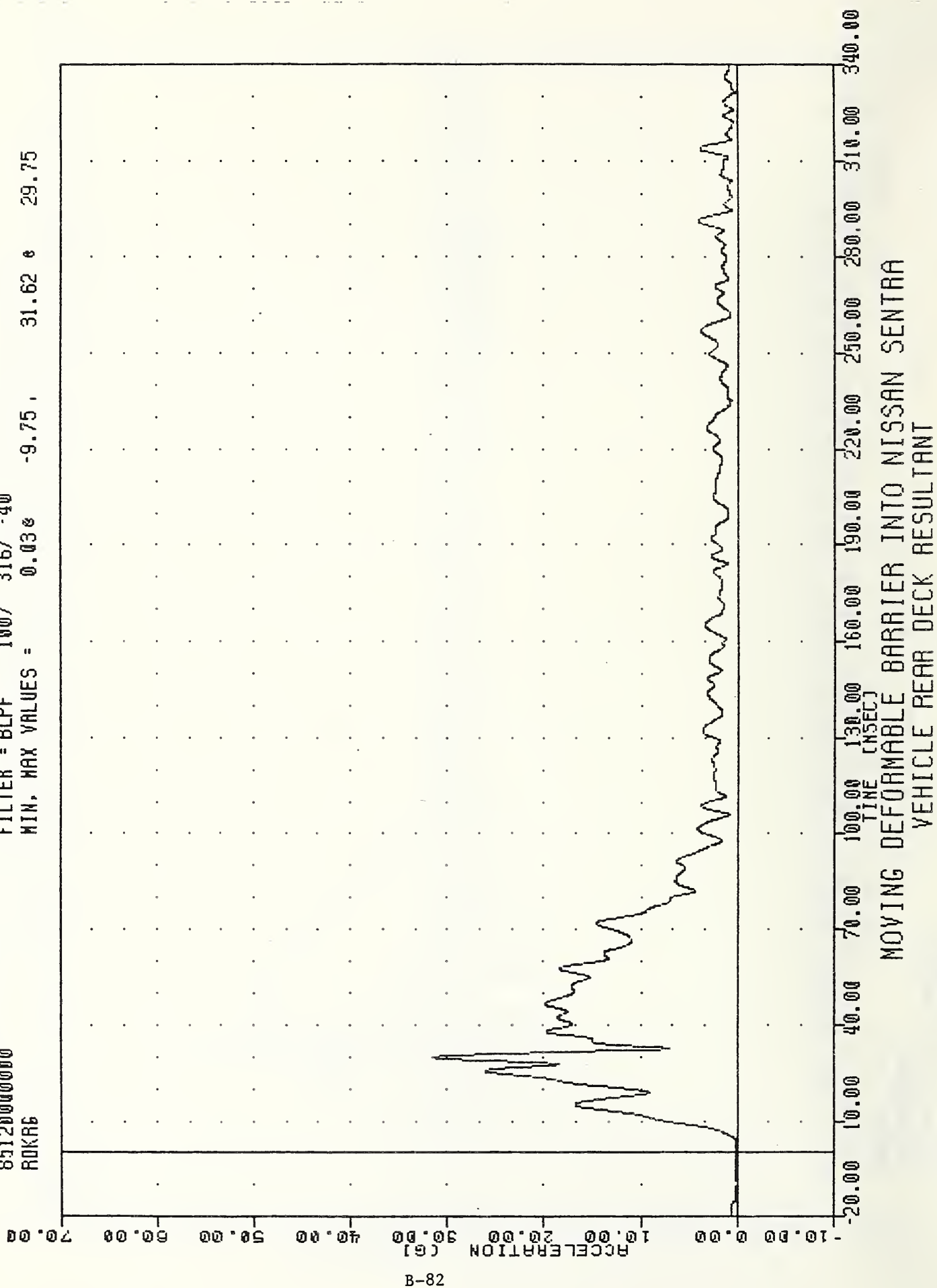
PLOT DATE 9-MAY-85 10:40:19

VAT ., 850430  
SI PROTECTION PROD VEH  
851200000000  
RDKZ6

FILTER = BLPF 100/ 316/ -40  
MIN. MAX VALUES = -29.430 29.68 , 15.64 25.63



VAT , 850430  
 SI PROTECTION PROD YEH  
 85120000000  
 ROKRG  
 PLOT DATE 9-MAY-85 10:42:04  
 FILTER = BLPF 100/ 316/ -40  
 MIN. MAX VALUES = 0.03e -9.75 , 31.62 e 29.75



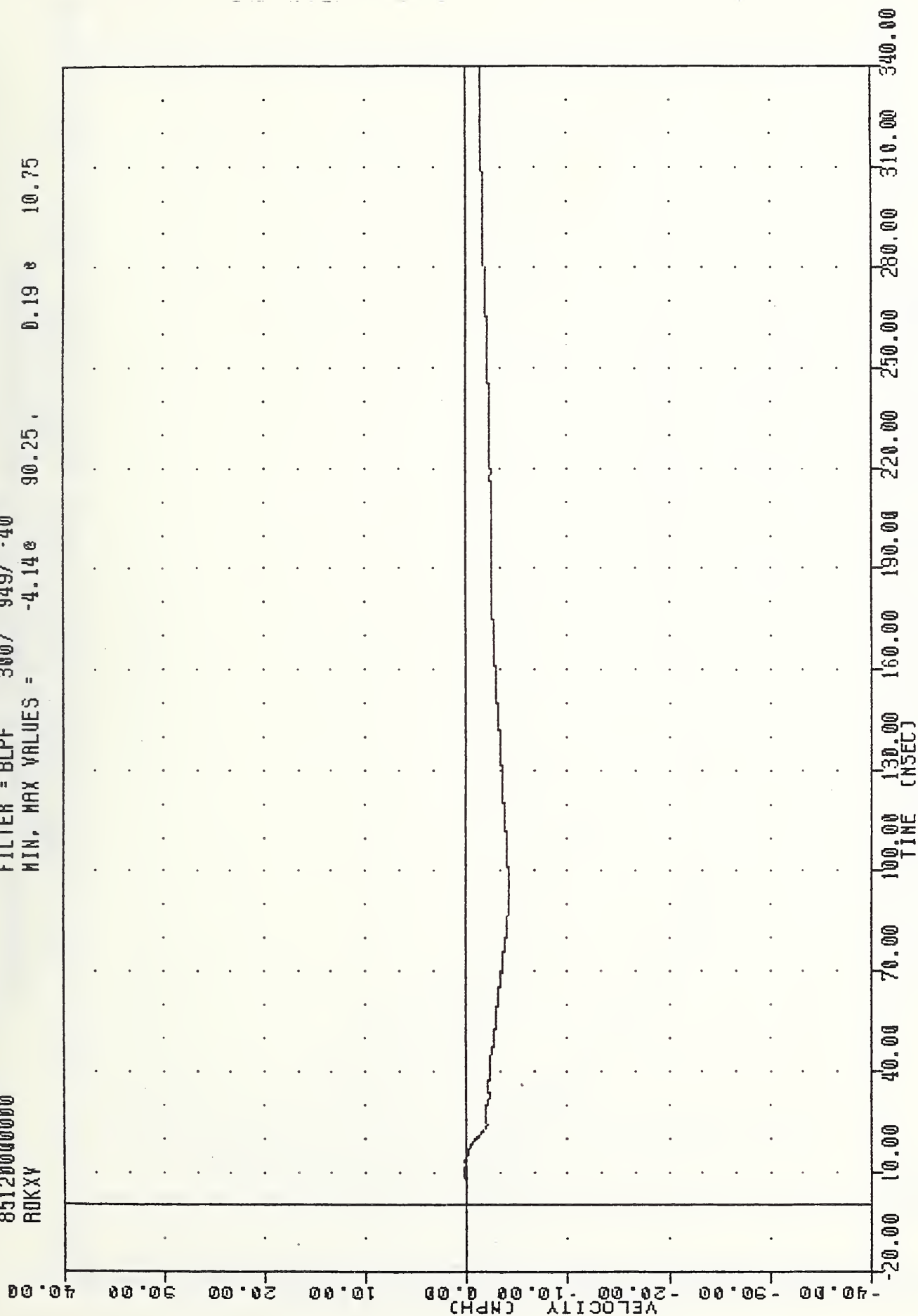
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE REAR DECK RESULTANT

PLOT DATE 9-MAY-85 10:40:19

VAT ., 850430  
SI PROTECTION PROD VEH  
851200000000  
RDKXY

FILTER = BLPF 300/ 949/ -40

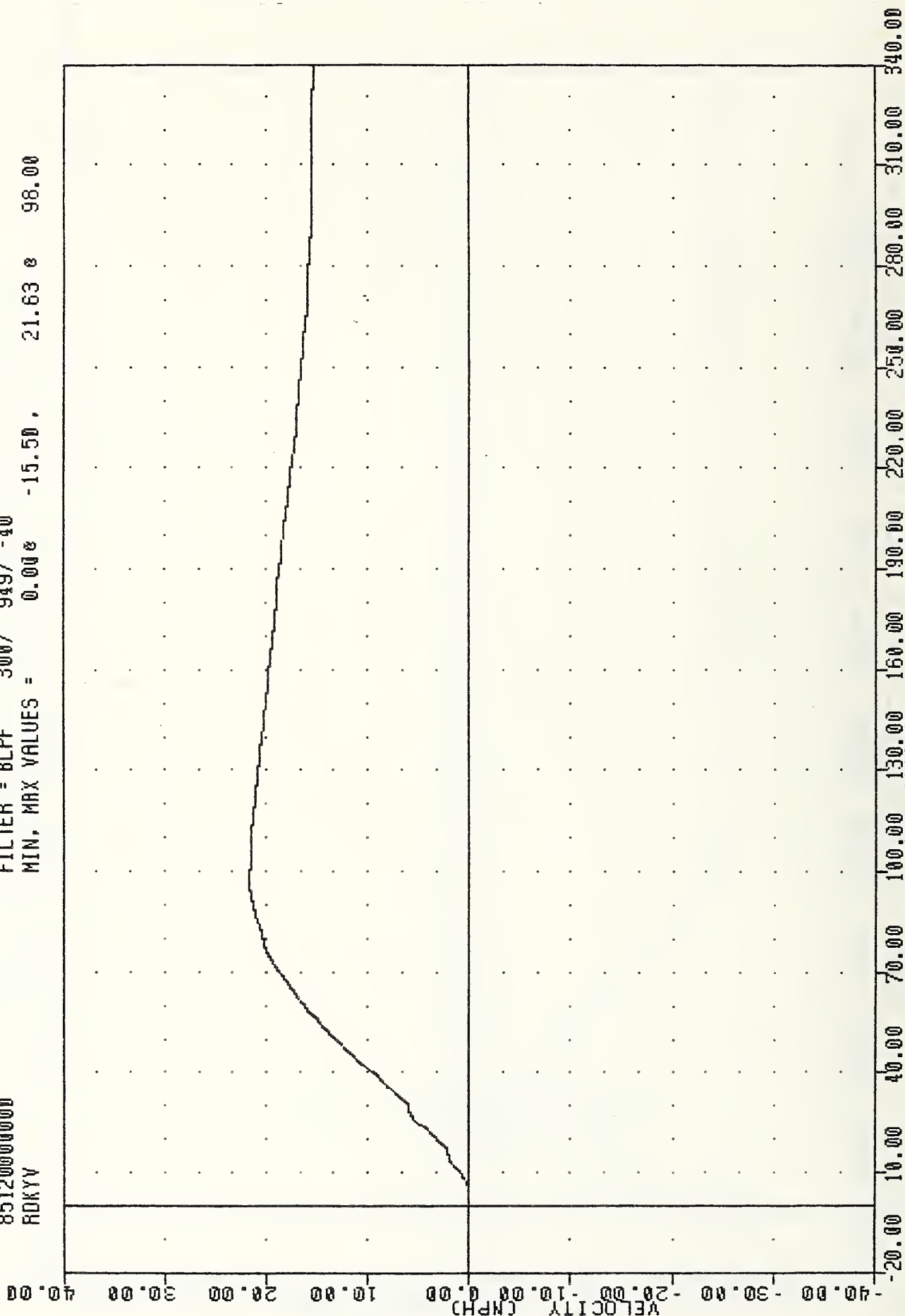
MIN, MAX VALUES = -4.14e 90.25, 0.19 e 10.75



PLOT DATE 9-MAY-85 10:40:19

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
RDKYV

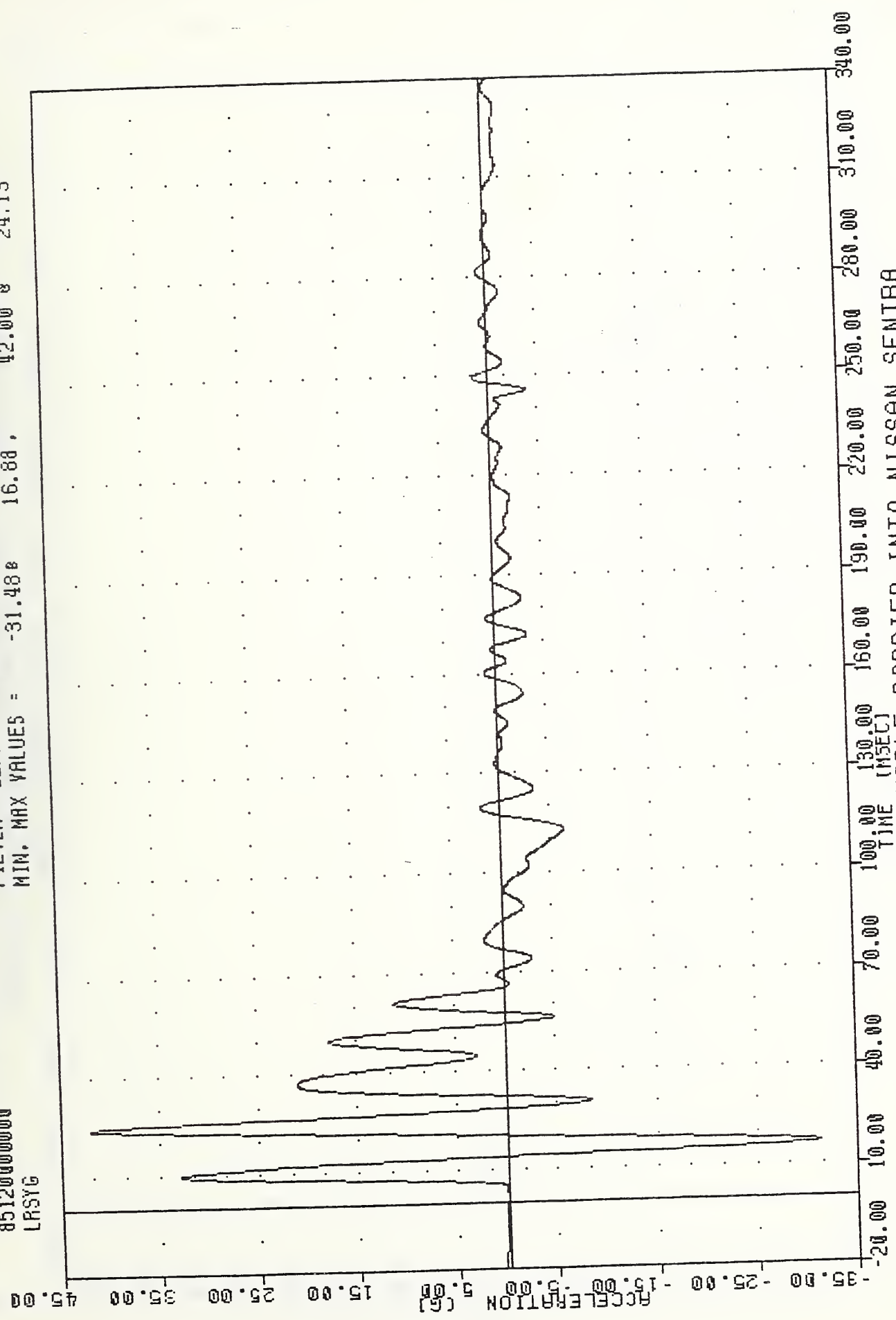
FILTER = BLPF 300/ 949/ -40  
MIN. MAX VALUES = 0.00 21.63 98.00  
-15.50



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING RDKY6

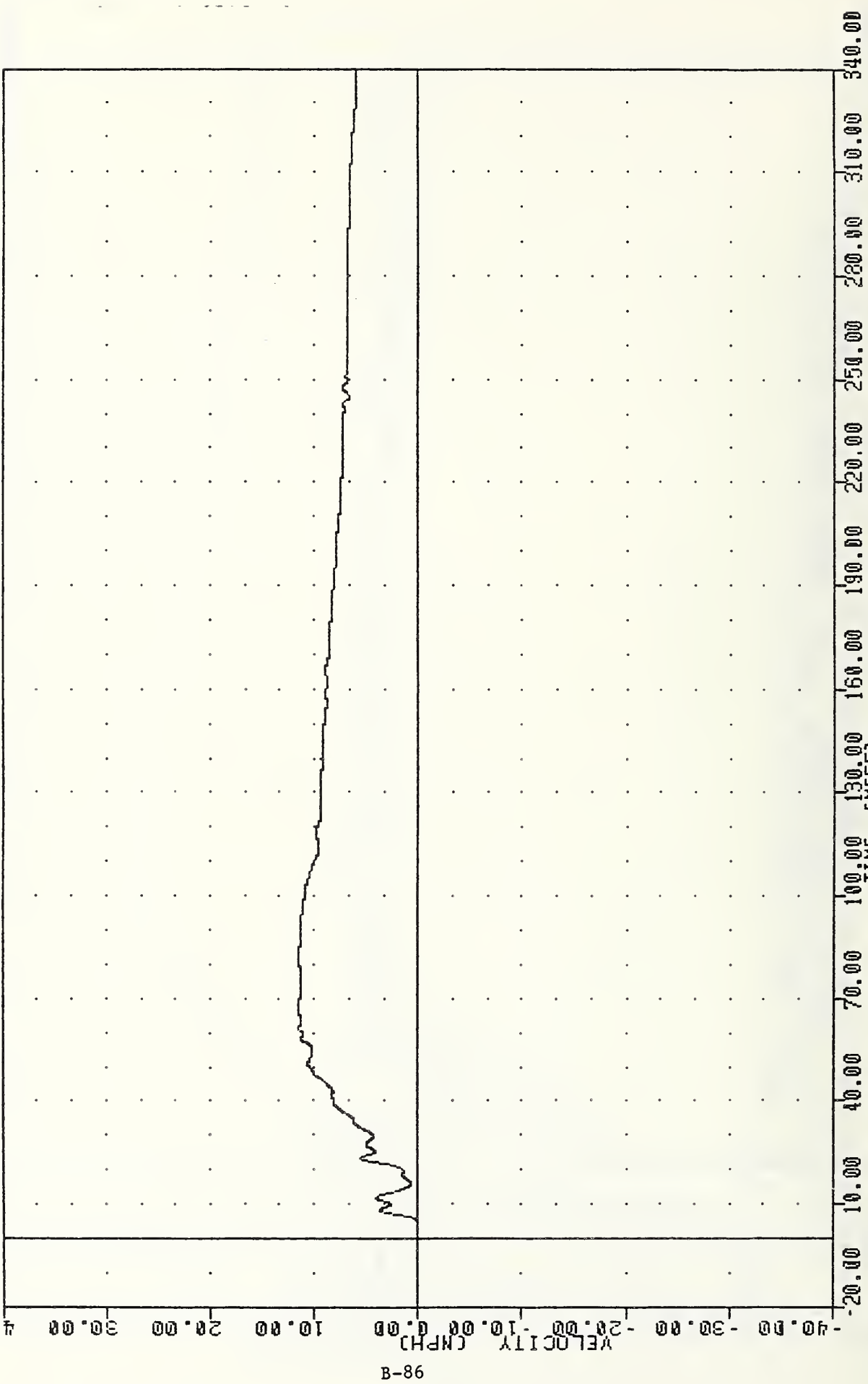
PLOT DATE 9-MAY-85 10:40:19  
 FILTER = BLPF 100/ 316/ -40  
 MIN. MAX VALUES = -31.48g 16.88g 42.00g 24.13

VRT . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LRSYG



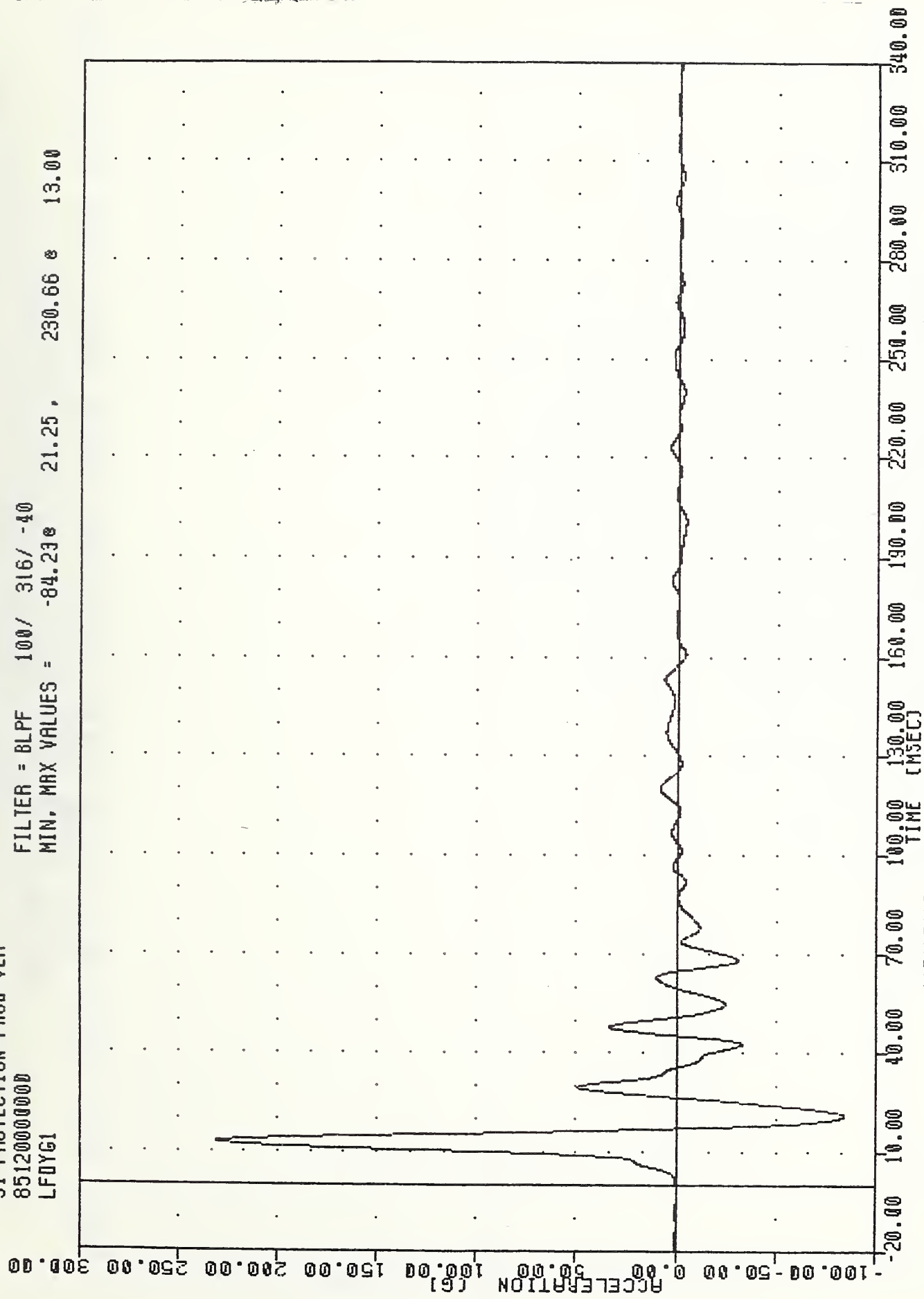
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

VR1 , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LRSYG  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = BLPF 300/ 949/ -40  
 MIN. MAX VALUES = 0.00e -20.00 , 11.56 e 66.38



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING LRSYG

VRT . . . 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 LFDYGI  
 PLOT DATE 9-MAY-85 10:40:19  
 FILTER = BLPF 100/ 316/ -40  
 MIN, MAX VALUES = -84.230 21.25, 230.66 & 13.00



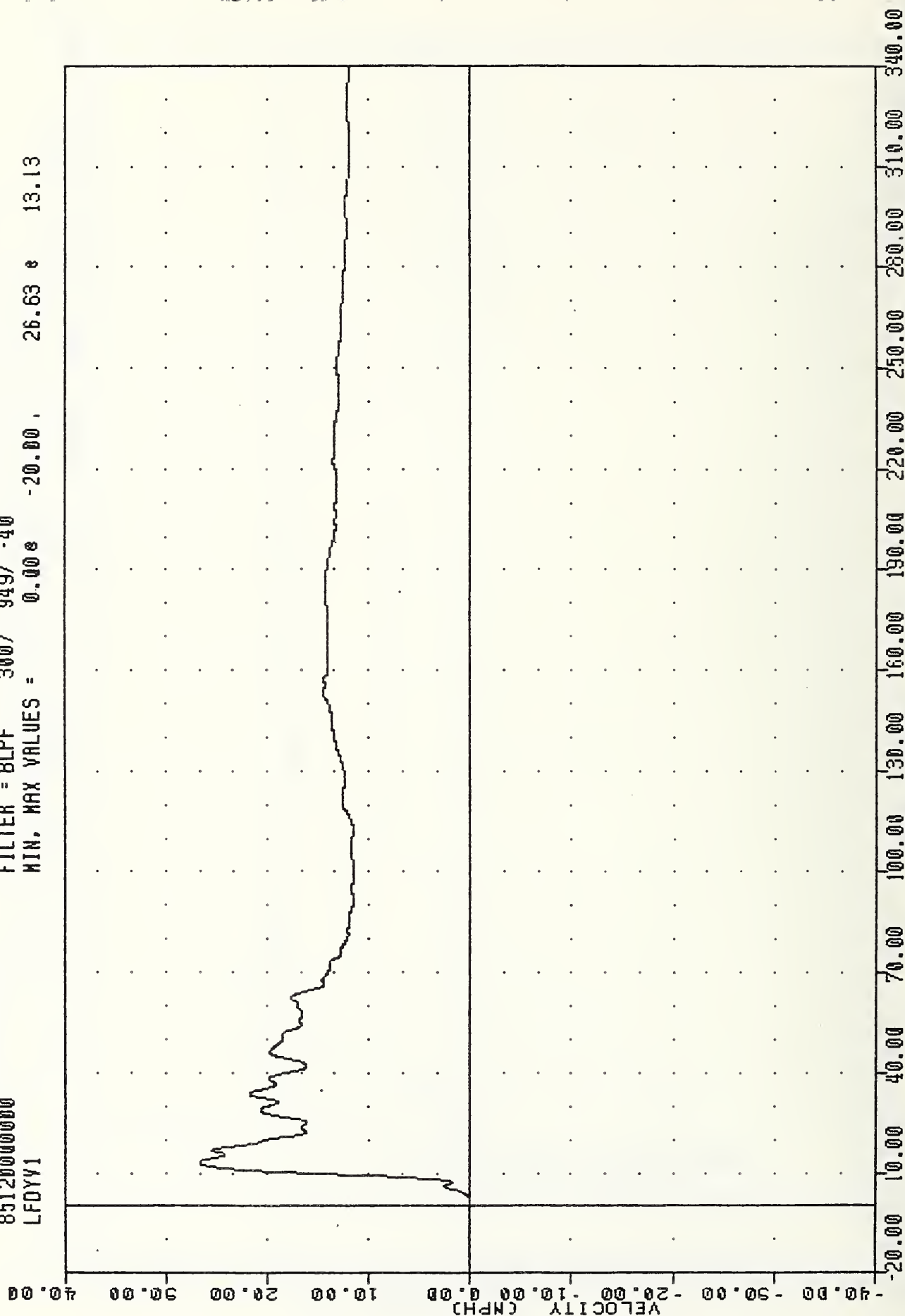
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

PLT DATE 9-MAY-85 10:40:19

VAT , 850430  
SI PROTECTION PROD VEH  
85120000000  
LFDYV1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.00e -20.00, 26.63 e 13.13



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING LFDYGI

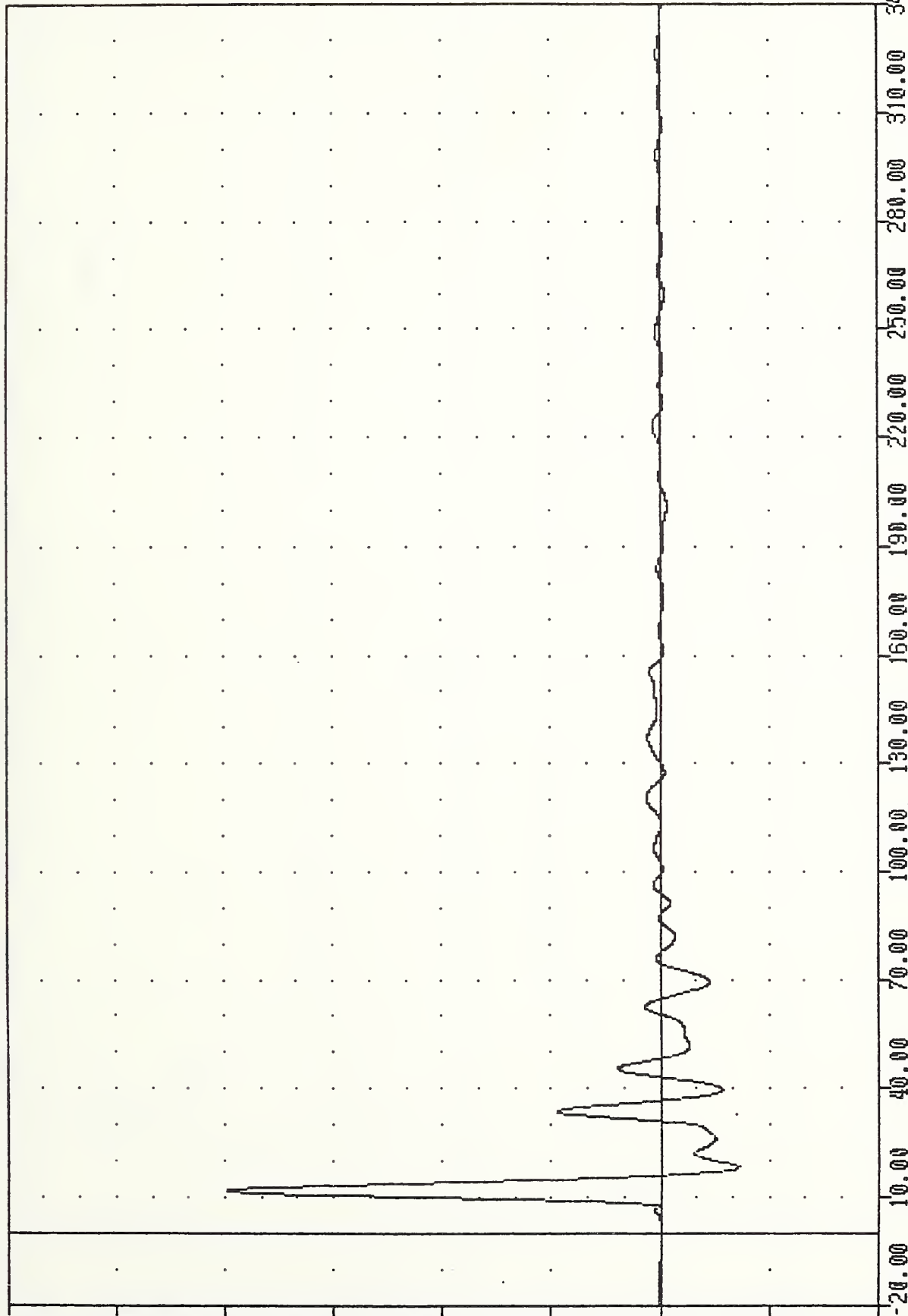
VRT . . 850430  
SI PROTECTION PROD VEH  
851200000000  
LFDY62

PLOT DATE 9-MAY-85 10:40:19

FILTER = BLPF 100/ 316/ -40

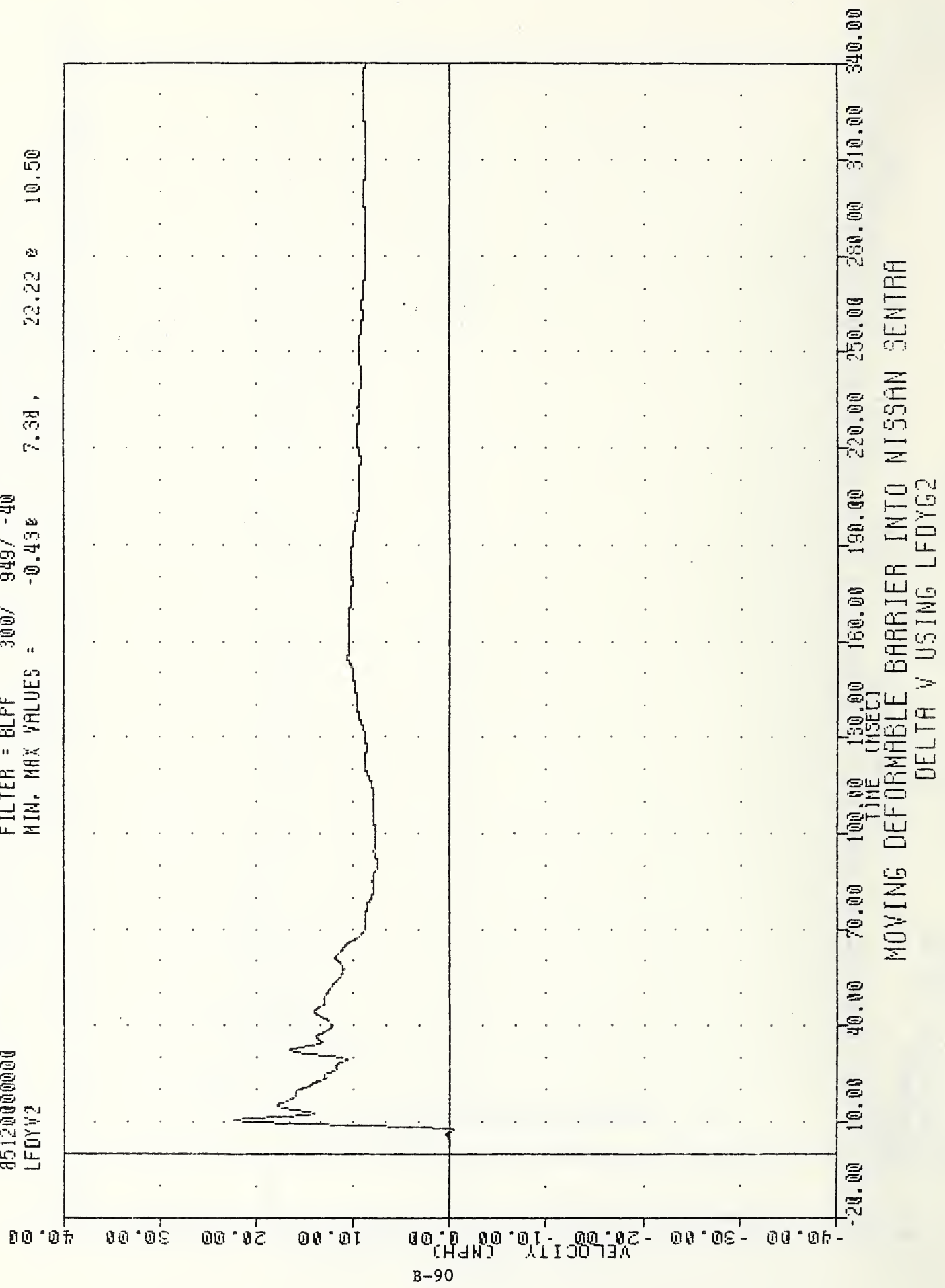
MIN. MAX VALUES = -36.02 18.25, 198.95 11.75

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

VRT , 850430  
 SI PROTECTION PROO VEH  
 851200000000  
 LFDYV2  
 FILTER = BLPF 300/ 949/ -40  
 MIN. MAX VALUES = -0.43e 7.38 , 22.22 e 10.50  
 PLOT DATE 17-JUN-85 15:54:23



B-90

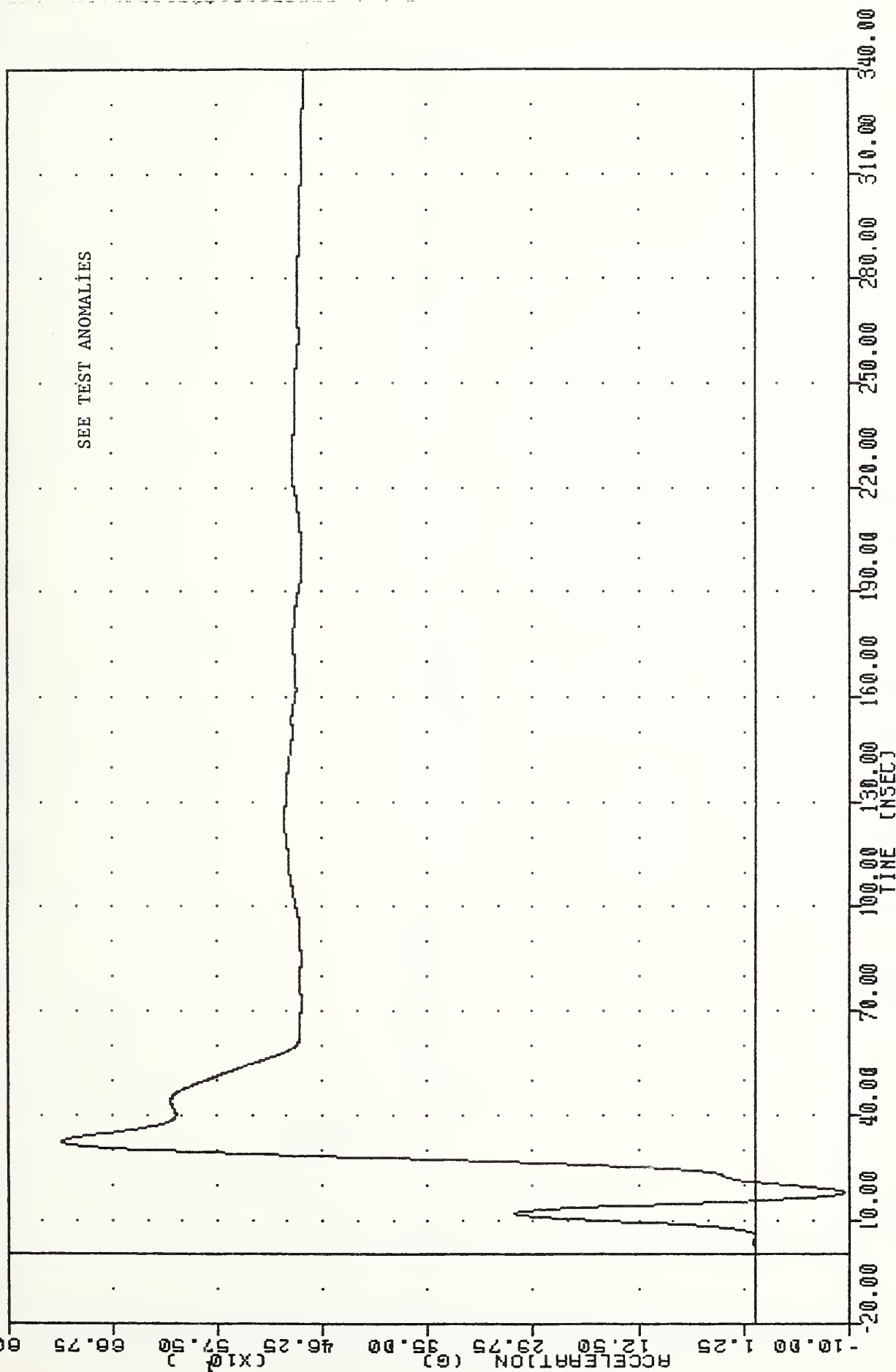
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 DELTA V USING LFDYV2

PLOT DATE 9-MAY-85 10:40:19

VAT 850430  
SI PROTECTION PRD YEH  
851200000000  
LFOY63

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -94.68 17.63 742.65 32.25

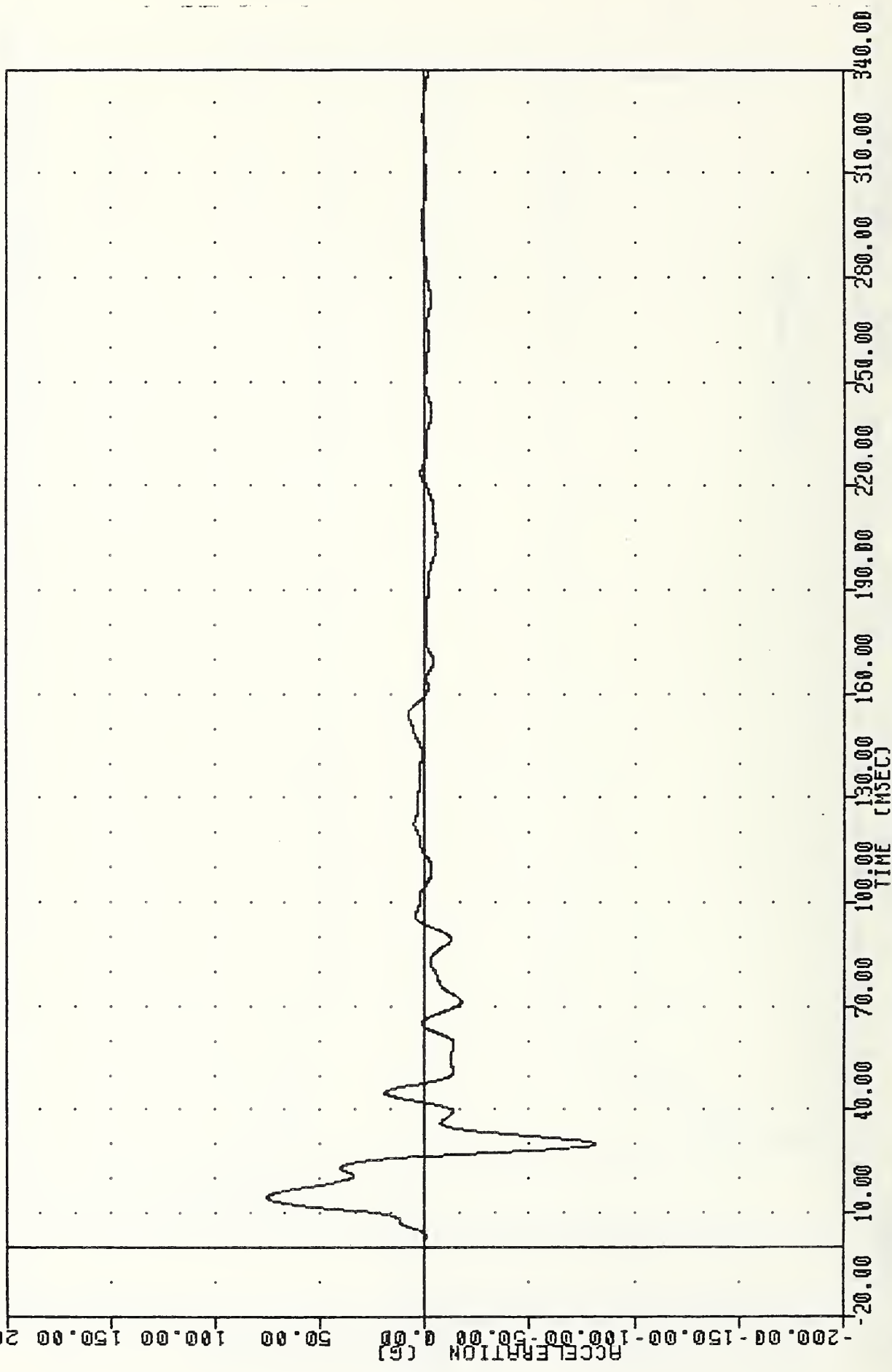


MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

PLOT DATE 9-MAY-85 10:40:19

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
LF0Y64

FILTER = 8LPF 100/ 316/ -40  
MIN. MAX VALUES = -81.19e 30.00, 75.45 e 14.50



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

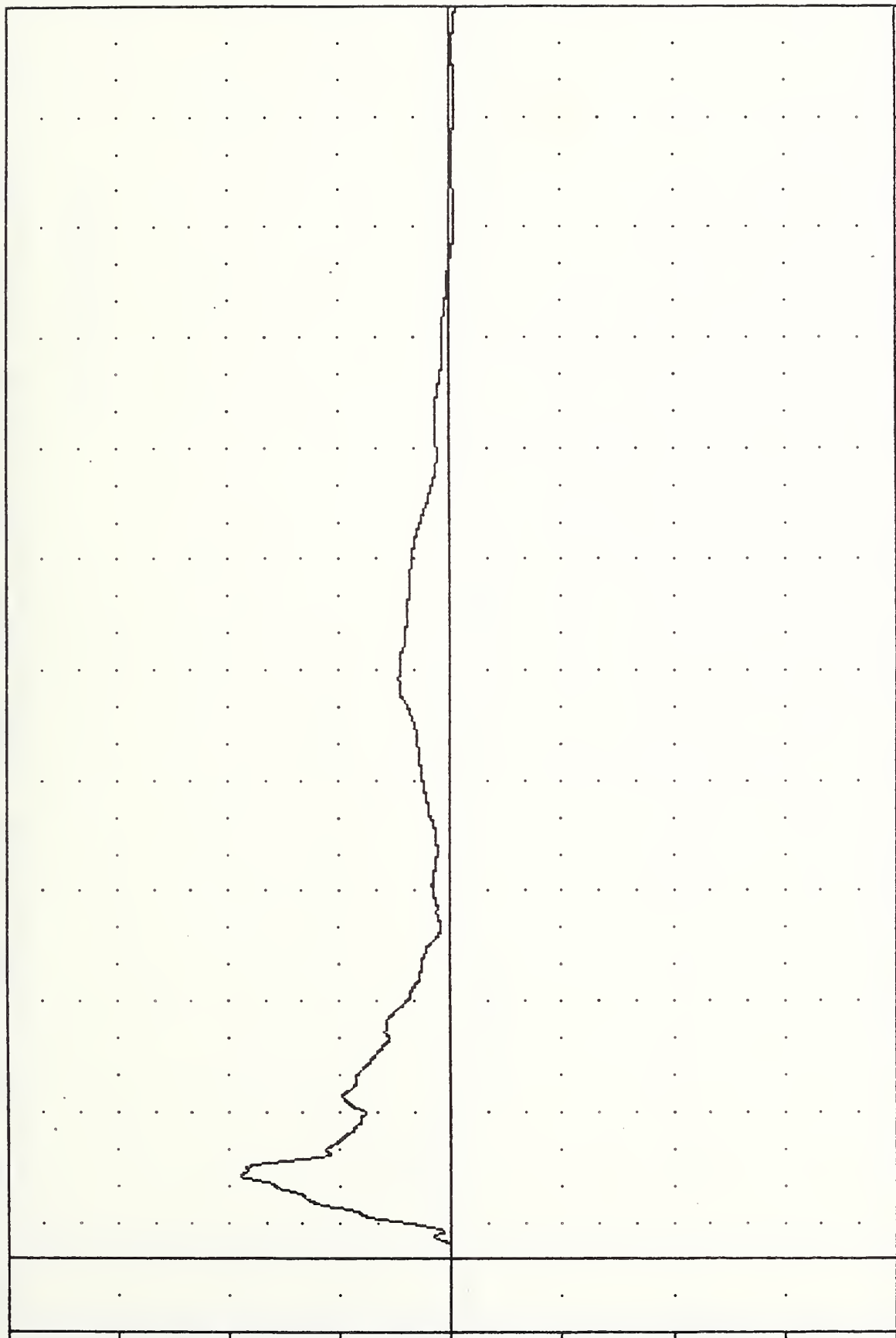
VAT ., 850430  
SI PROTECTION PROD YEH  
851200000000  
LFDYV4

PLOT DATE 9-MAY-85 10:40:19

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.57% 340.00, 19.01 @ 22.63

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING LFDYV4

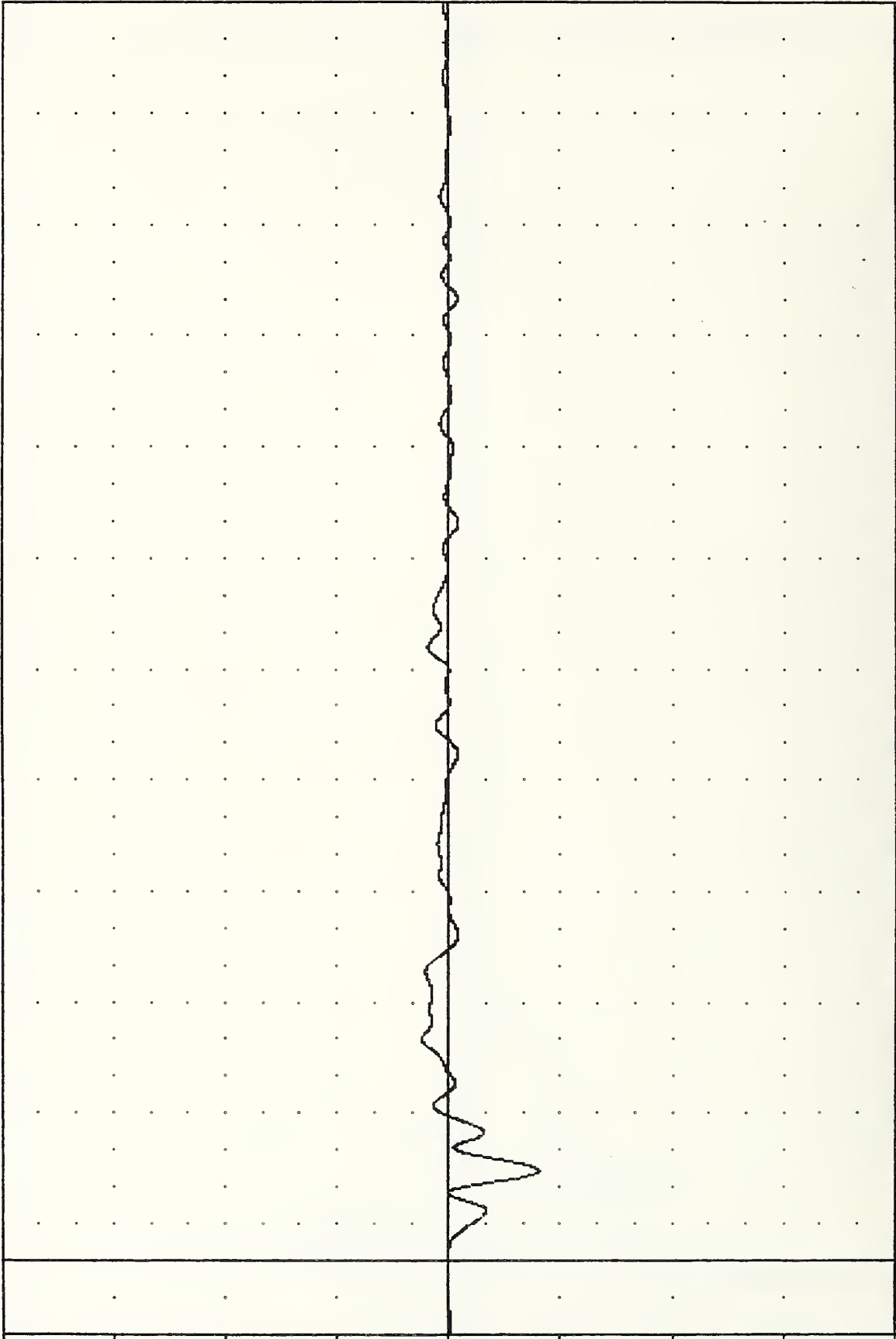
PLOT DATE 9-MAY-85 10:40:19

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
TFRXG

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -8.11g 24.38, 2.42 g 60.00

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

PLOT DATE 9-MAY-85 10:40:19

VRT . . 850430

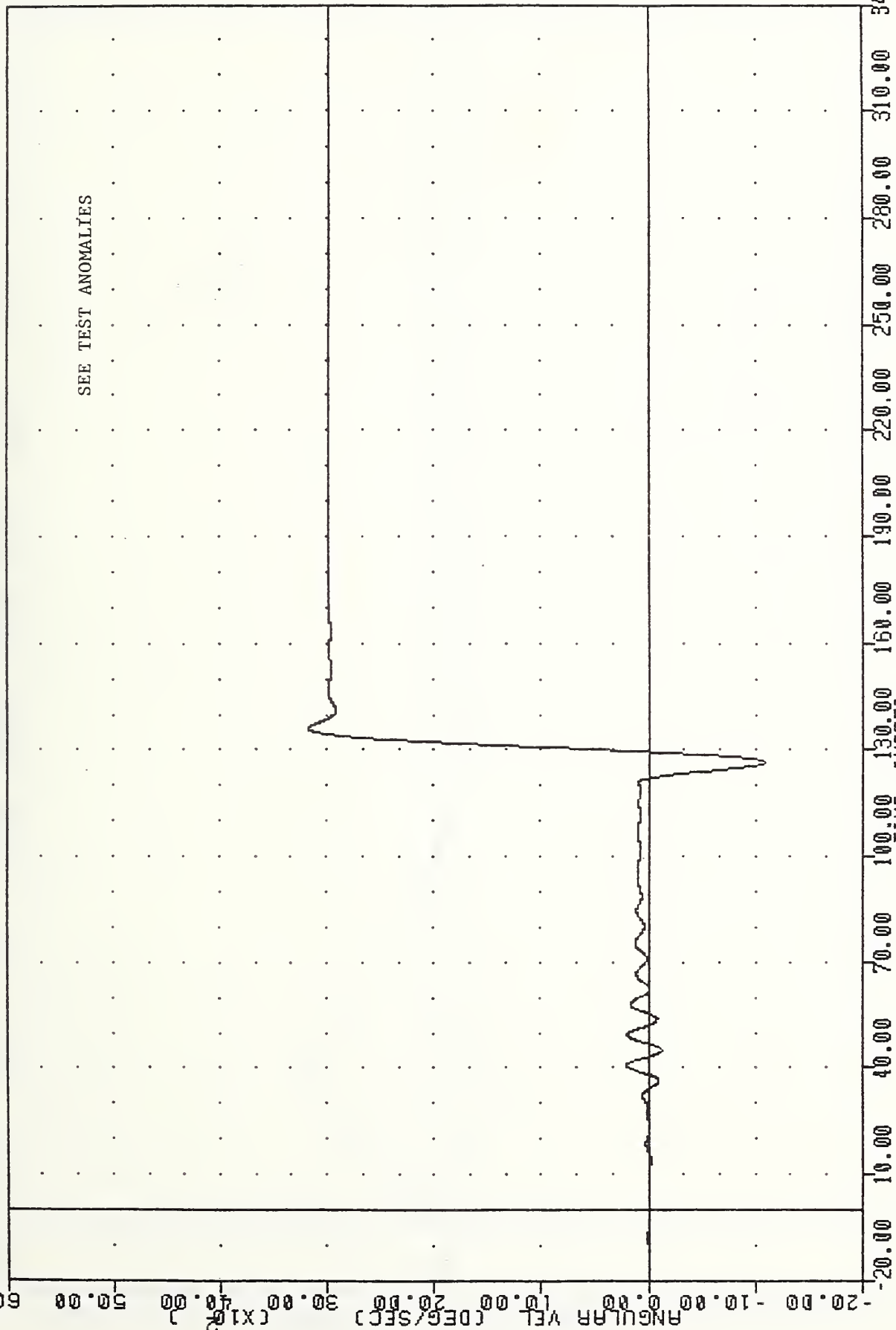
SI PROTECTION PROD VEH

851200000000

VCGV

FILTER = BLPF 100/ 316/ -40

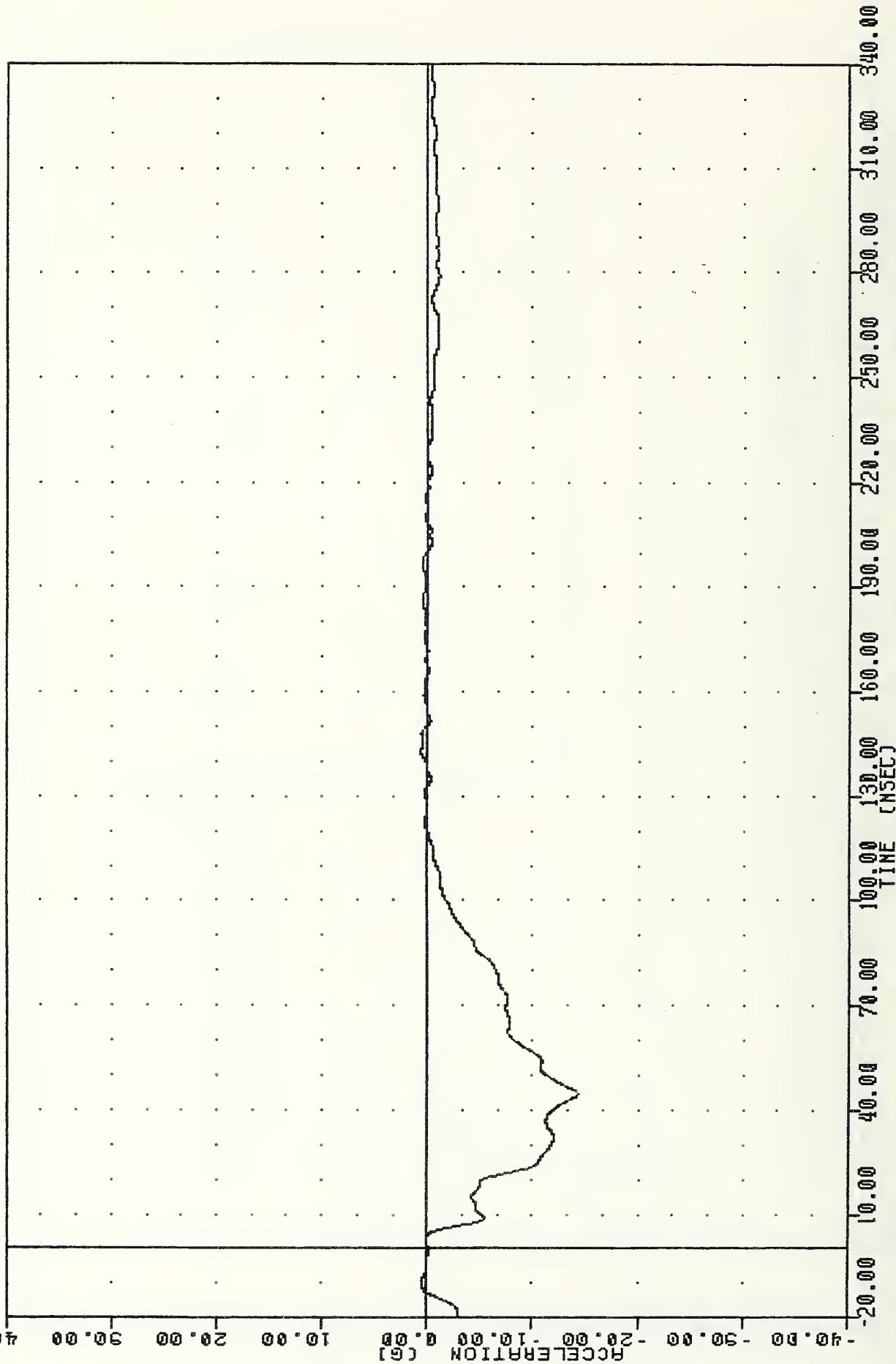
MIN, MAX VALUES = -1096.19 126.50, 3168.49 136.00



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
VEHICLE YAW RATE DEGREES/SEC

VAT , 850430  
SI PROTECTION PROD VEH  
851200000000  
BCGX6

PLOT DATE 9-MAY-85 10:40:19  
FILTER = BLPF 100/ 316/ -40  
MIN, MAX VALUES = -14.29 44.75 , 0.64 143.00



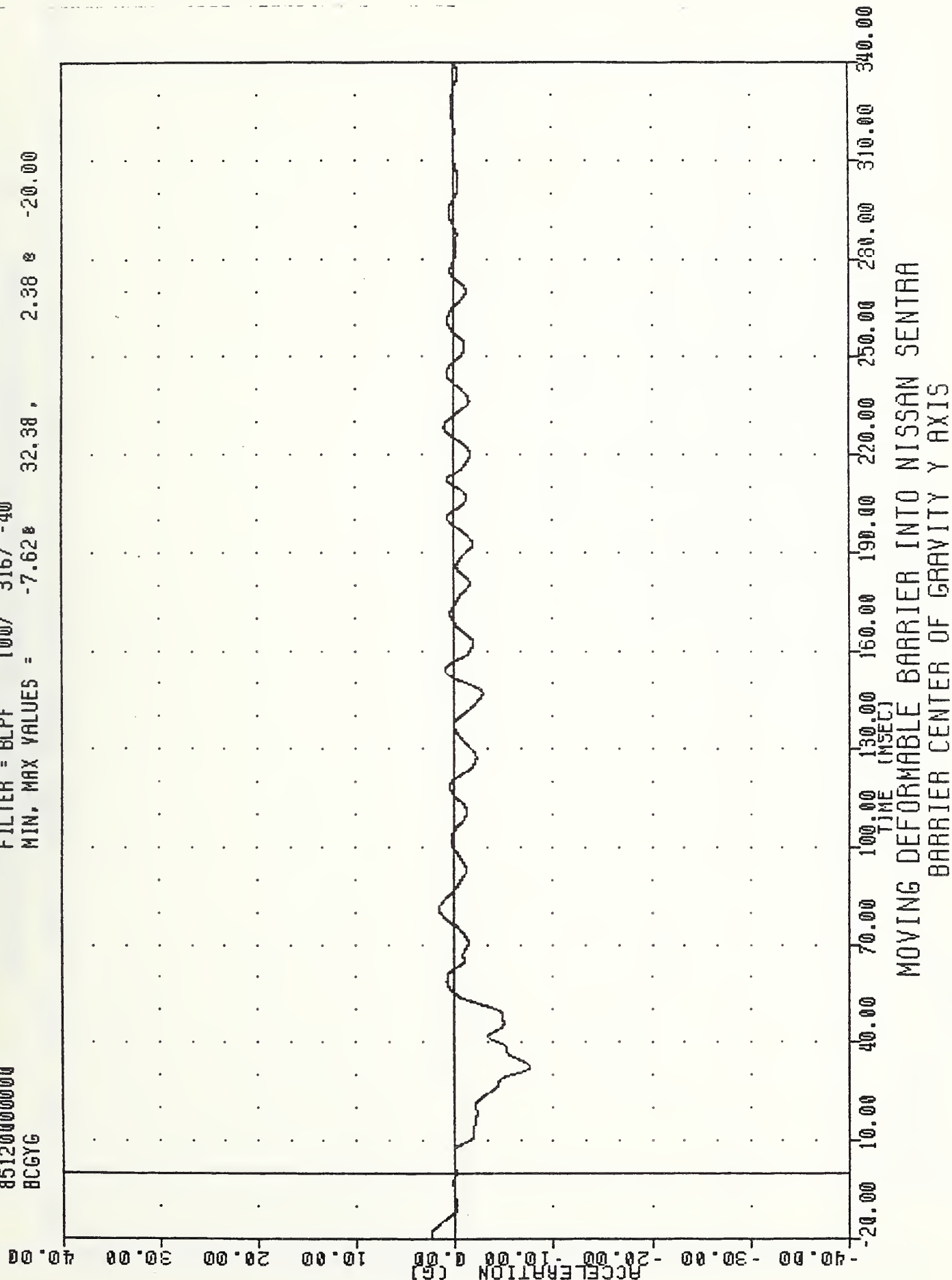
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
BARRIER CENTER OF GRAVITY X AXIS

PLOT DATE 9-MAY-85 10:40:19

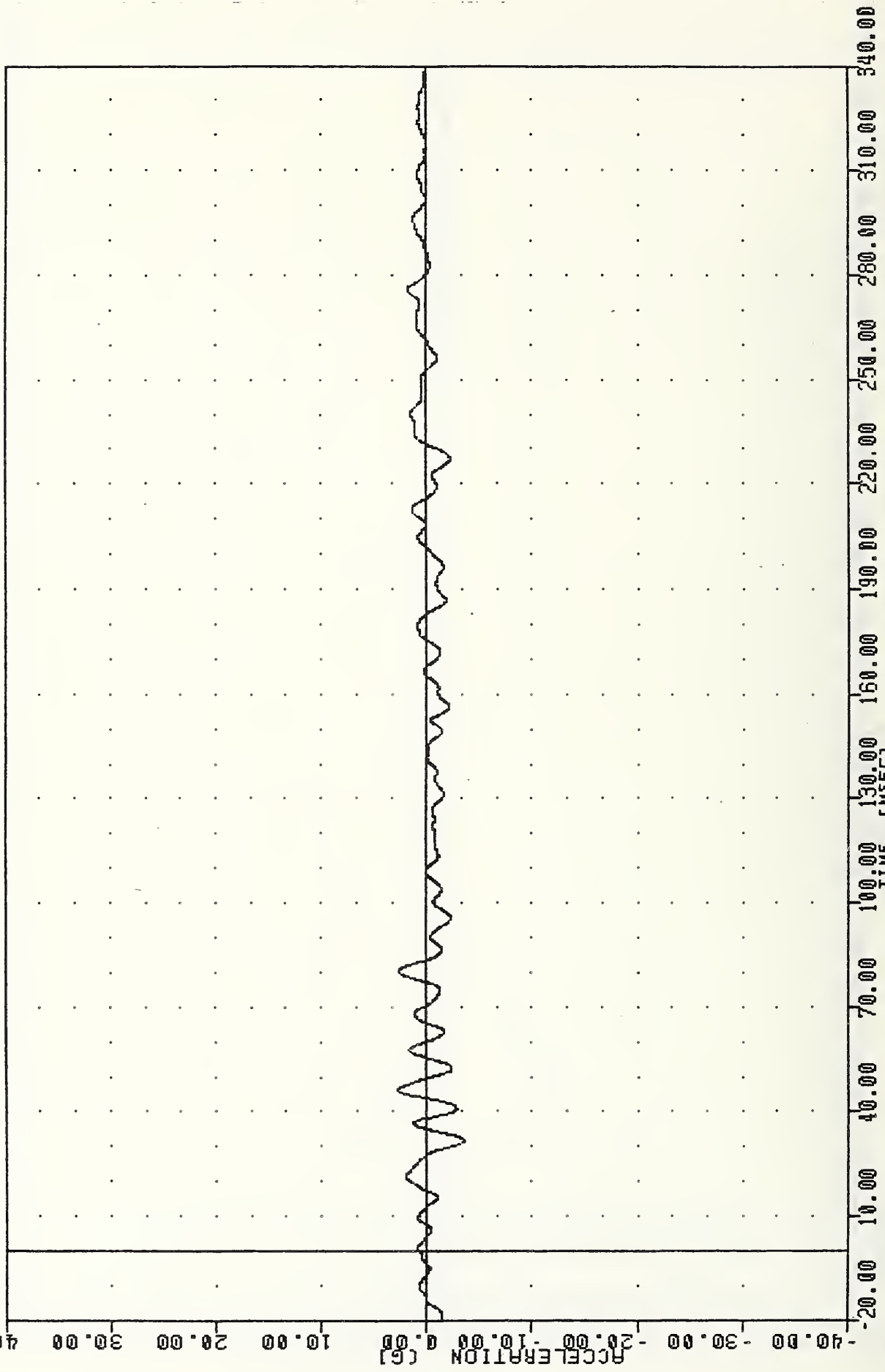
VRT ., 850430  
SI PROTECTION PROD VEH  
851200000000  
BCGYG

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.62 32.38 2.38 -20.00



VRT , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 BCGZG  
 FILTER = BLPF 100/ 316/ -40  
 MIN. MAX VALUES = -3.49 31.75 , 2.79 46.25



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 BARRIER CENTER OF GRAVITY Z AXIS

VRT  
SI PROTECTION PROD VEH  
85120000000  
BCGRG

PLOT DATE 9-MAY-85 10:42:04

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.098 -6.50, 15.19 45.13

70.00

60.00

50.00

40.00

30.00

B-99

20.00

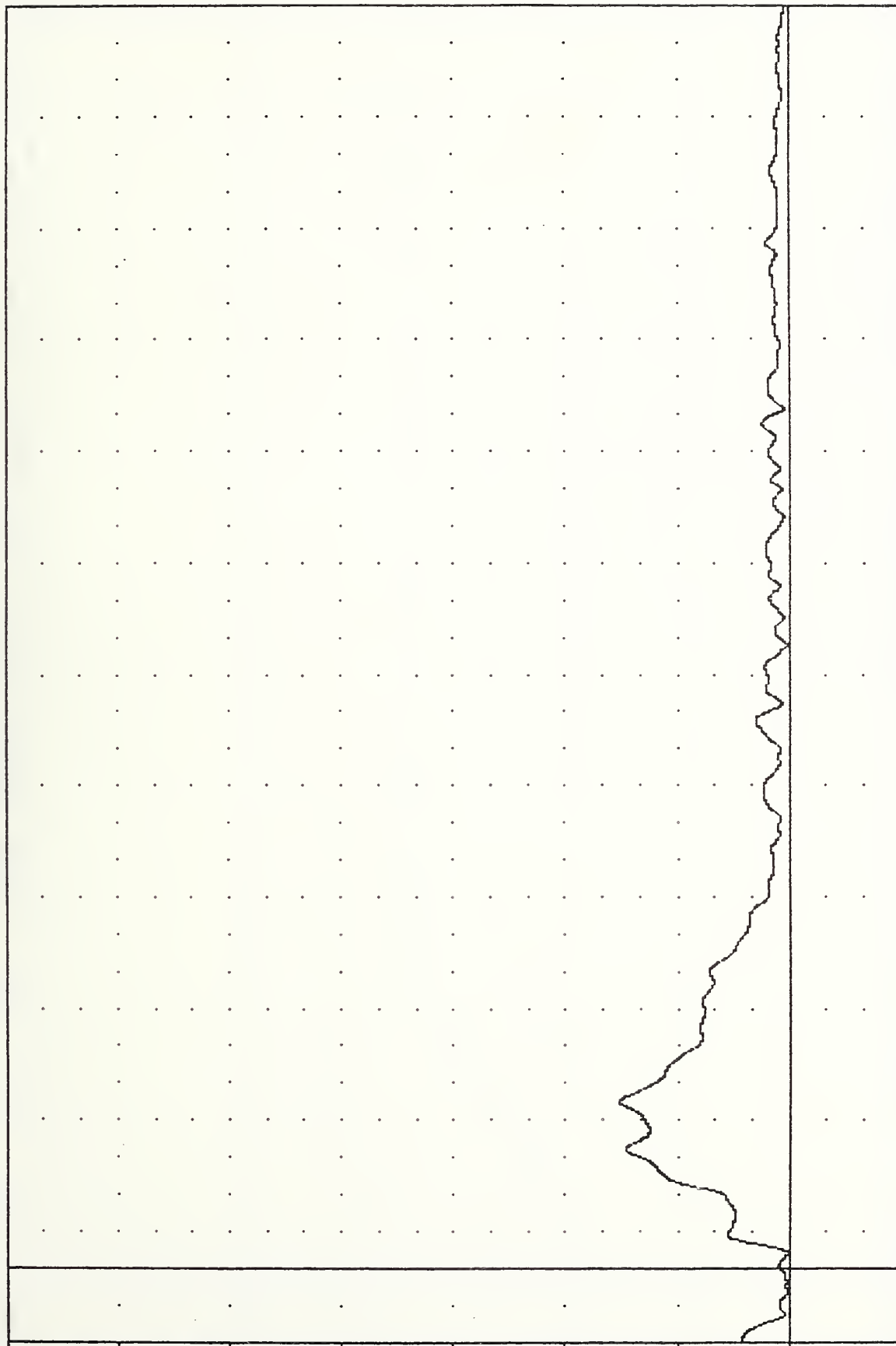
10.00

0.00

-10.00

-20.00

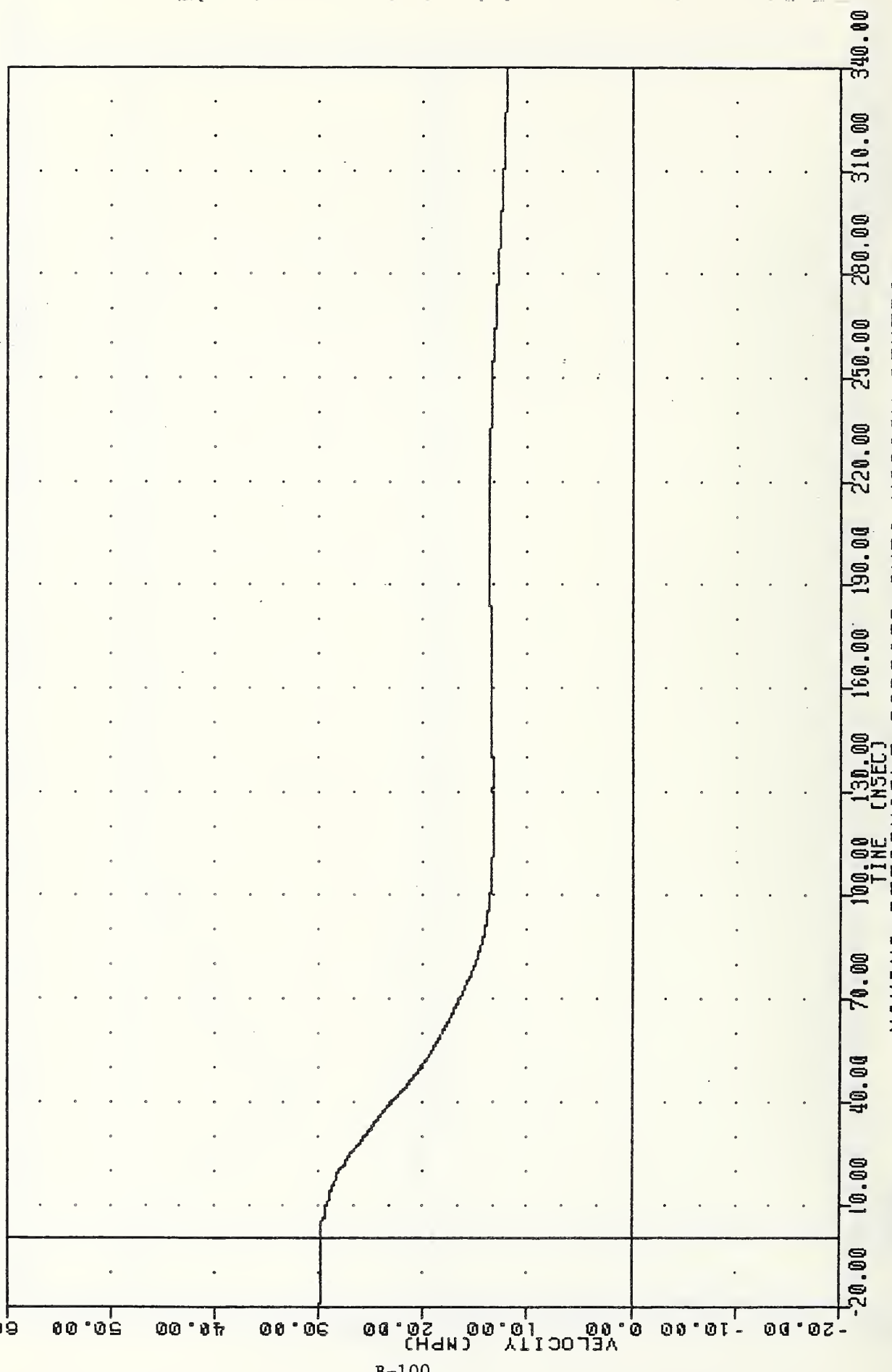
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
BARRIER CG RESULTANT

VRT , 850430  
SI PROTECTION PROD VEH  
851200000000  
BCGXV

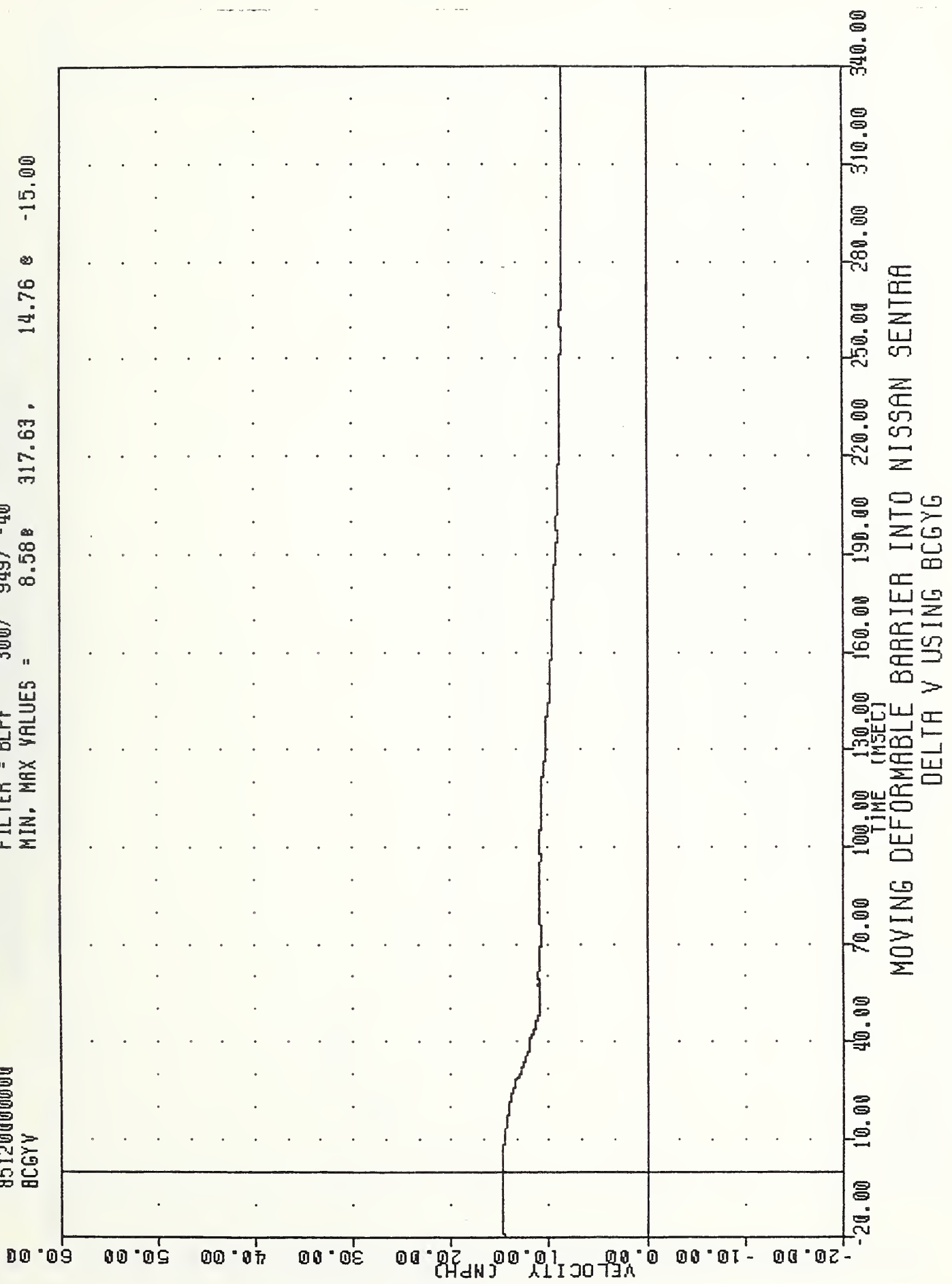
PLOT DATE 9-MAY-85 10:40:19  
FILTER = BLPF 300/ 949/ -40  
MIN, MAX VALUES = 11.97e 339.88 , 30.00 e -20.00



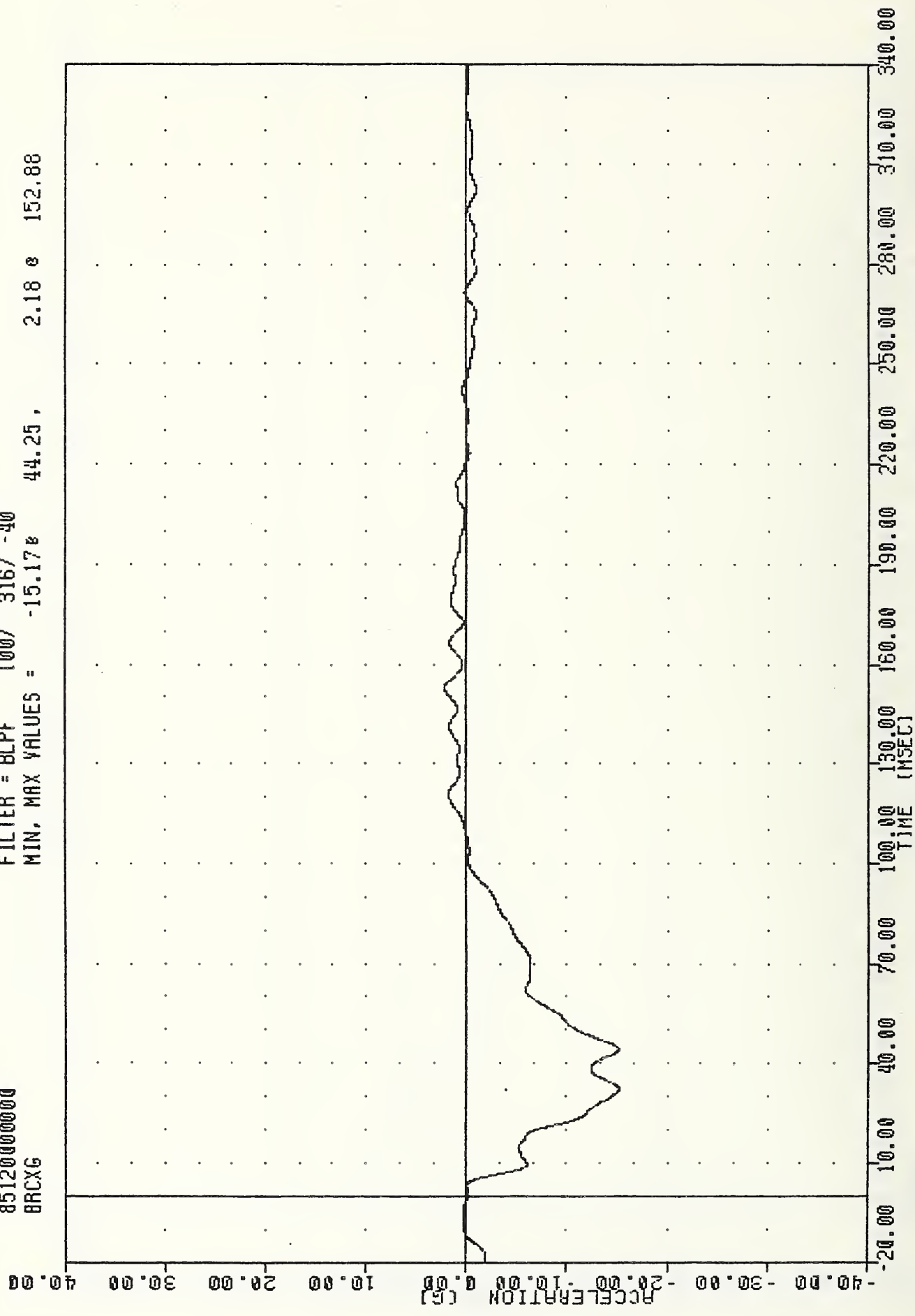
B-100

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA Y USING BCGXG

VRT                      , 850430  
 SI PROTECTION PROD VEH  
 851200000000  
 BCGYV  
 PLOT DATE    9-MAY-85    10:40:19  
 FILTER = BLPF    300/    949/    -40  
 MIN, MAX VALUES =    8.58    317.63,    14.76    -15.00



VRT , 850430  
 SI PROTECTION PROD VEH  
 85120000000  
 BRXG  
 FILTER = BLPF 100/ 316/ -40  
 MIN, MAX VALUES = -15.17 44.25, 2.18 152.88  
 PLOT DATE 9-MAY-85 10:40:19



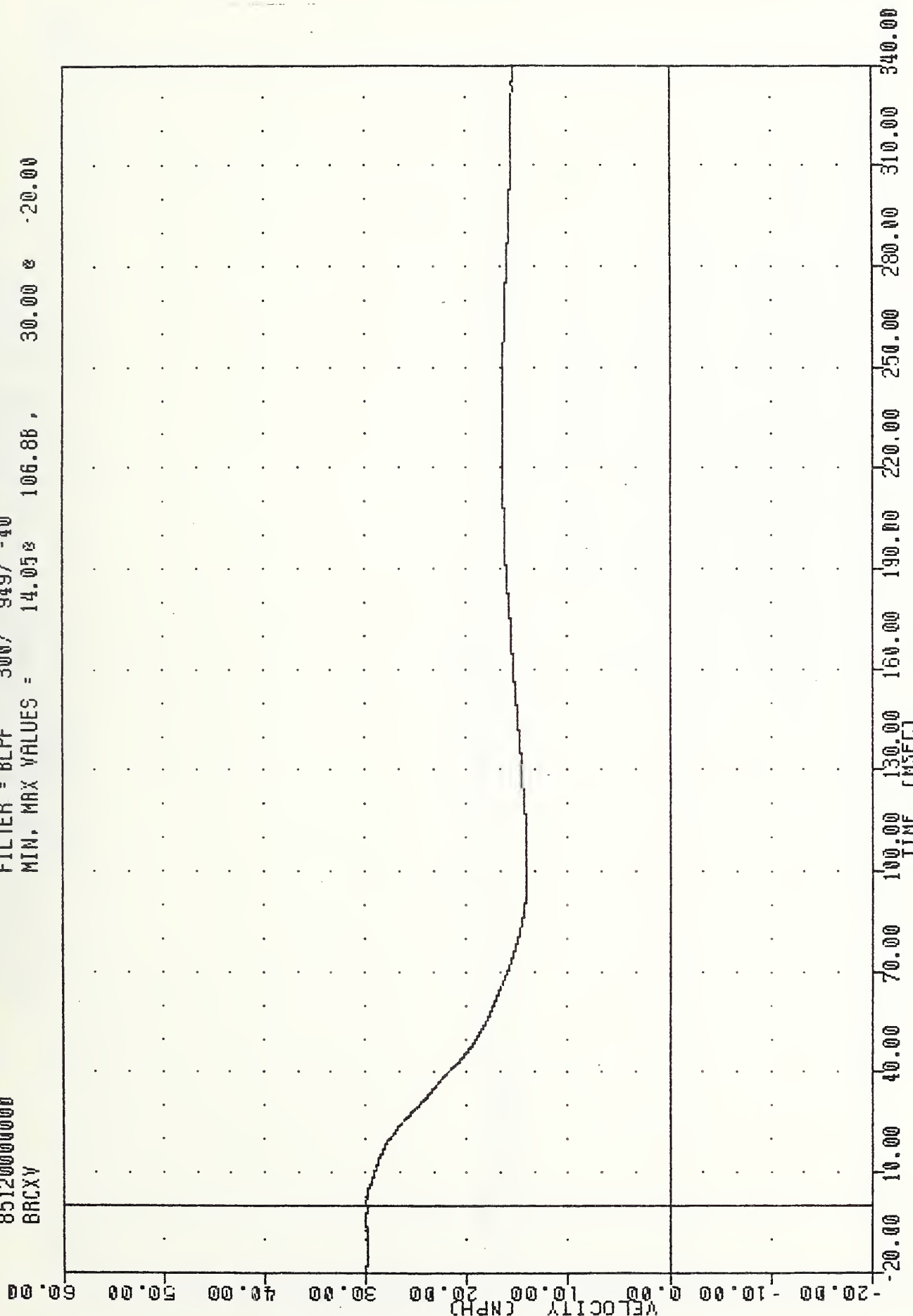
MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
 BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

VRT  
SI PROTECTION PROD VEH  
851200000000  
BRCXY

PLOT DATE 9-MAY-85 10:40:19

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 14.058 106.86, 30.00 & -20.00



MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA Y USING BRCXG

PLOT DATE 9-MAY-85 10:40:19

VRT , 850430

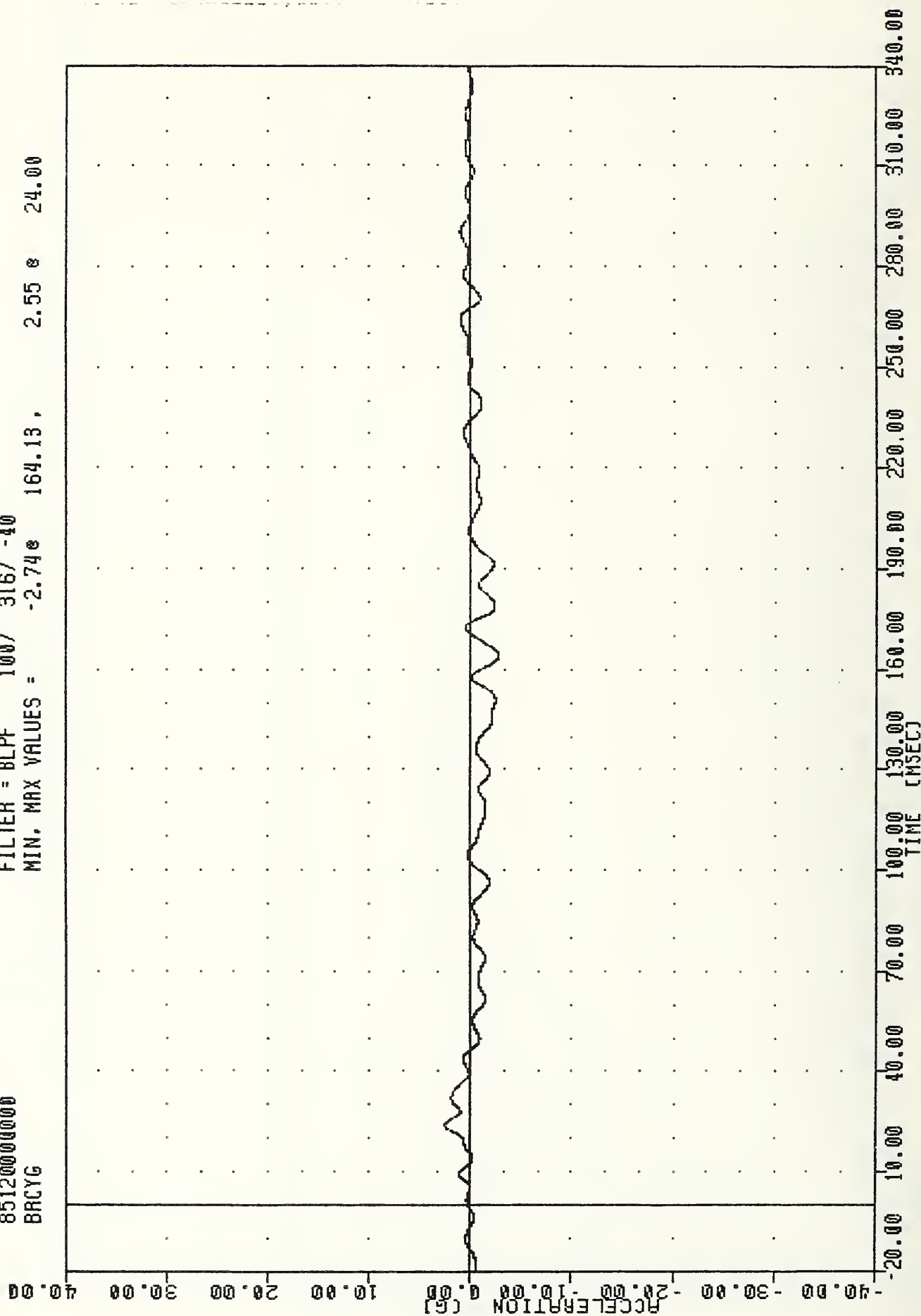
SI PROTECTION PROD VEH

851200000000

FILTER = BLPF 100/ 316/ -40

BRCYG

MIN, MAX VALUES = -2.74e 164.13, 2.55 e 24.00



VAT 850430  
SI PROTECTION PROD VEH  
85120000000  
BRCYV

PLOT DATE 9-MAY-85 10:40:19

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 11.47 240.50

15.44 43.75

60.00

50.00

40.00

30.00

20.00

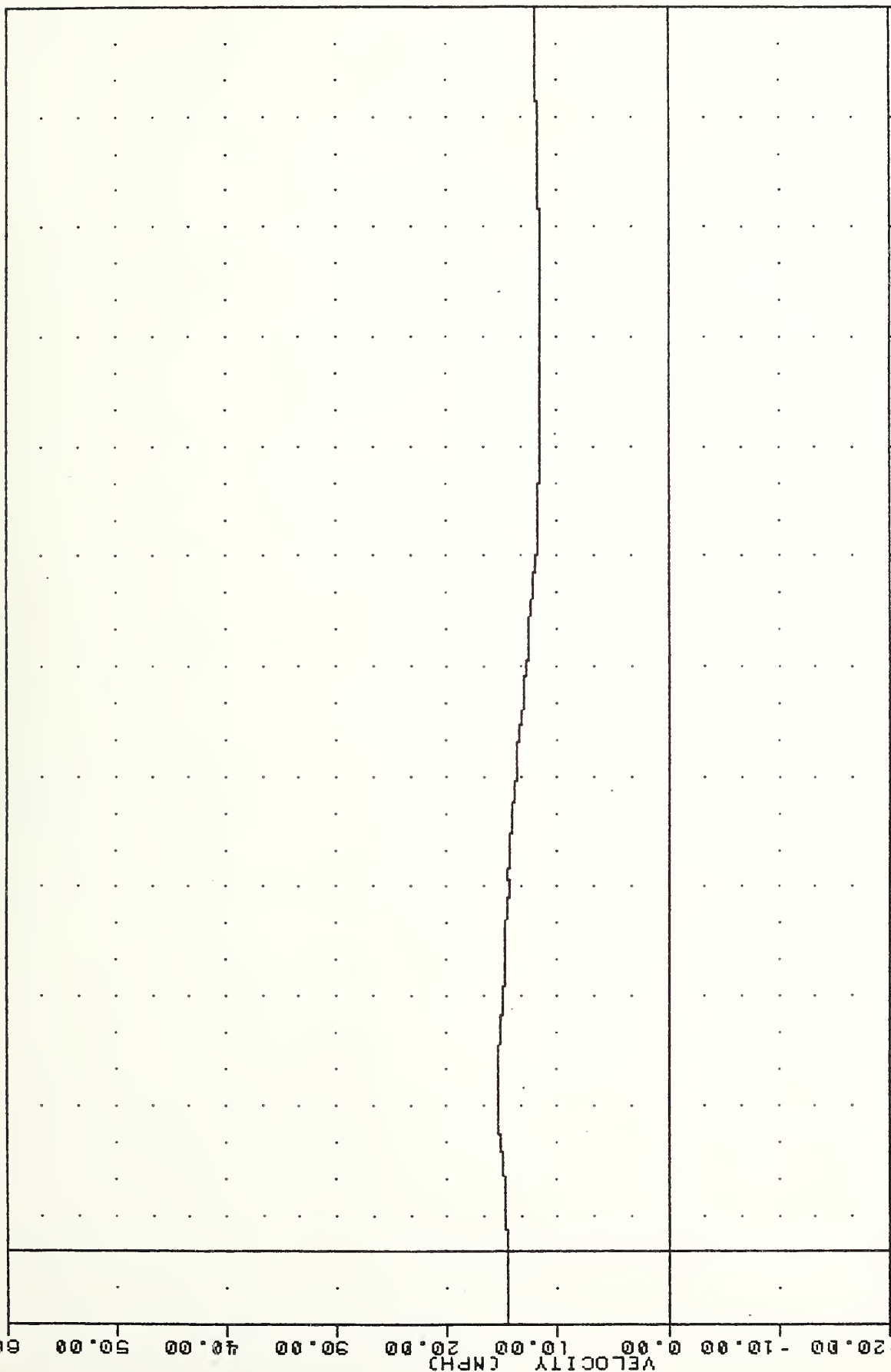
10.00

0.00

-10.00

-20.00

B-105



-20.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00

0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MOVING DEFORMABLE BARRIER INTO NISSAN SENTRA  
DELTA V USING BRCYG



APPENDIX C  
DUMMY CERTIFICATION

SIDE IMPACT DUMMY CALIBRATION  
DUMMY SERIAL NUMBER 123

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g)	
			SPECIFICATION	TEST RESULT
HEAD 4/19/85	HEAD Y-AXIS	1000	150-175	182.54*
THORAX 4/19/85	LEFT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	37.24
	REDUNDANT	180	36-50	40.08
	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	23.71
	REDUNDANT	180	16-24.6	23.71
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	24.70
	REDUNDANT	180	17.6-26.4	24.31
PELVIS 4/19/85	PELVIS Y-AXIS	180	50-65	55.73

\*DUMMY DID NOT MEET SPECIFICATION.

SIDE IMPACT DUMMY CALIBRATION  
DUMMY SERIAL NUMBER U02

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g)	
			SPECIFICATION	TEST RESULT
HEAD 4/19/85	HEAD Y-AXIS	1000	150-175	191.86*
THORAX 4/19/85	LEFT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	42.11
	REDUNDANT	180	36-50	44.75
	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	24.23
	REDUNDANT	180	16-24.6	24.32
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	23.72
	REDUNDANT	180	17.6-26.4	23.70
PELVIS 4/19/85	PELVIS Y-AXIS	180	50-65	93.15*

\*DUMMY DID NOT MEET SPECIFICATION.



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